I 29.2: G76

Clemson University

3 1604 019 571 704

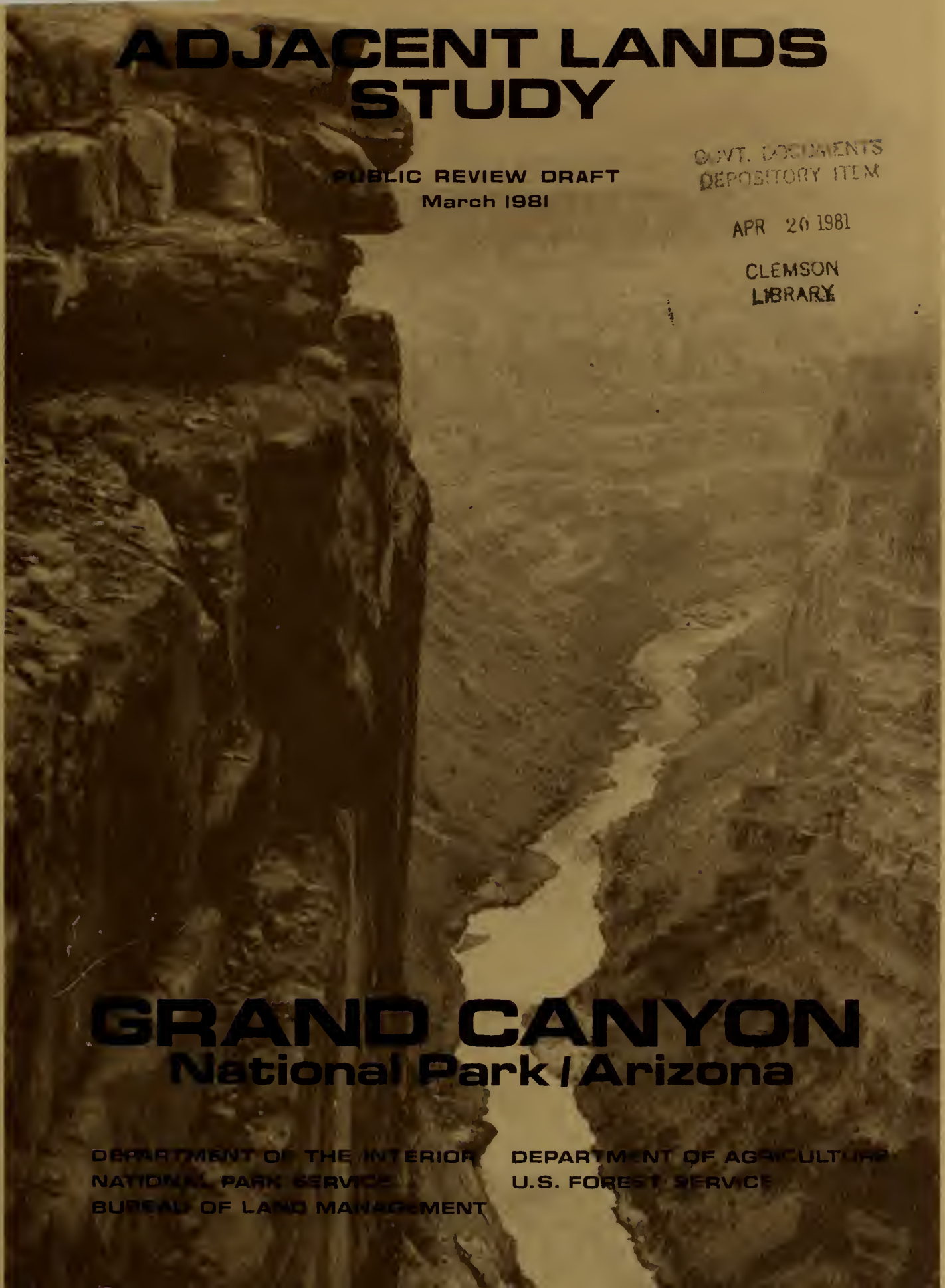
ADJACENT LANDS STUDY

PUBLIC REVIEW DRAFT
March 1981

GOVT. DOCUMENTS
DEPOSITORY ITEM

APR 20 1981

CLEMSON
LIBRARY



GRAND CANYON
National Park / Arizona

DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
BUREAU OF LAND MANAGEMENT

DEPARTMENT OF AGRICULTURE
U.S. FOREST SERVICE

ADJACENT LANDS STUDY

GRAND CANYON NATIONAL PARK
ARIZONA

CONTENTS

Pages

Introduction.....i

Background.....1

The Grand Canyon Region.....6

The Arizona Strip.....8

The Study Area Environment.....12

Prehistory and Archeology.....26

Land Use of the Study Area.....29

Management Options and Recommendations.....40

- Management Considerations
- Management Options
- Recommendations

References.....48

Appendix.....A-1

INTRODUCTION

This draft report documents the Grand Canyon Adjacent Lands Study completed by the National Park Service and Bureau of Land Management in the Department of Interior and the U.S. Forest Service in the Department of Agriculture.

The body of the report describes the lands of the study area, evaluates the significance of the resources, and the uses practiced on these lands. Land management options for the study areas are discussed and the study team's findings and tentative conclusions included at the end of the report.

This draft report is for public review and comment. It is being distributed to all individuals, organizations, and government agencies that indicated an interest in the study as it progressed. We invite your comments and suggestions regarding the report and its findings. Please send your comment to:

National Park Service
Western Regional Office
450 Golden Gate Avenue, Box 36063
San Francisco, CA 94102
Attention: Grand Canyon Adjacent Lands Study

The public record will remain open for 45 days at which time the comments received will be analyzed and relevant input incorporated into the report as necessary.

The revised report, including a record of public involvement, will be the Final Adjacent Lands Study for Grand Canyon National Park. It will be transmitted to the Secretaries of the Interior and Agriculture for their consideration in making their recommendations to Congress in compliance with Public Law 93-620 and Conference Report #93-1611.

GRAND CANYON NATIONAL PARK

ADJACENT LANDS

RECONNAISSANCE STUDY

BACKGROUND

On January 3, 1975, Senate Bill 1296, the Grand Canyon National Park Enlargement Act, was signed into law (Public Law 93-620). This act was designed ". . . to further protect the outstanding scenic, natural and scientific values of the Grand Canyon by enlarging the Grand Canyon National Park in the State of Arizona."

The Enlargement Act consolidated into the park the former Grand Canyon and Marble Canyon National Monuments, portions of the Kaibab National Forest and Lake Mead National Recreation Area. This action unified the administration of these portions of the canyon and thereby advanced the efficient and effective protection of its natural environment.

During the process leading up to the creation of the law, a Committee of Conference was convened to resolve differences in the House and Senate versions of Senate Bill 1296. The direction for preparing this reconnaissance study is found in the Joint Statement of that Committee of Conference of House and Senate members (Report #93-1611). A Conference Report and accompanying Joint Statement were submitted with the final version of Senate Bill 1296 for the President's signature on December 17, 1974. The pertinent text of that statement is as follows:

(1) Areas to be included

Both the House and Senate versions of S. 1296 were designed to consolidate into one Grand Canyon National Park the geographic area known as "The Grand Canyon." While the Senate version included much of the same area as the House version, the House amendments would have included some significant side canyon systems and encompassed the entire Grand Canyon and the entire Colorado River from the Paria River to the Grand Wash Cliffs near the headwaters of Lake Mead. In resolving these differences, the members of the Conference Committee recommended the boundaries approved by the House with the following exceptions:

(1) Parashant, Andrus and Whitmore Canyons;

(2) Kanab Canyon; and

(3) Shivwits Plateau

While the managers did not include their recommendation for these areas, their potential park value was recognized and it was agreed that they should be studied by the Secretary of the Interior for possible future consideration for addition to the Park by the Congress. To this end, the Committee of Conference directs the Secretary of the Interior to study these areas to determine if they or any part of them qualify for national park designation. Once this study is completed, it is to be transmitted, together with his recommendations to the Congress, for its consideration.

In December 1975 the Assistant Secretary of Interior for Fish, Wildlife and Parks designated the National Park Service as lead agency in the conduct of this reconnaisance study. Subsequently, the National Park Service requested the cooperation and participation of the Bureau of Land Management and the U.S. Forest Service as affected agencies in the preparation of the study. These agencies then jointly agreed on a more specific definition of the study area lands as follows:

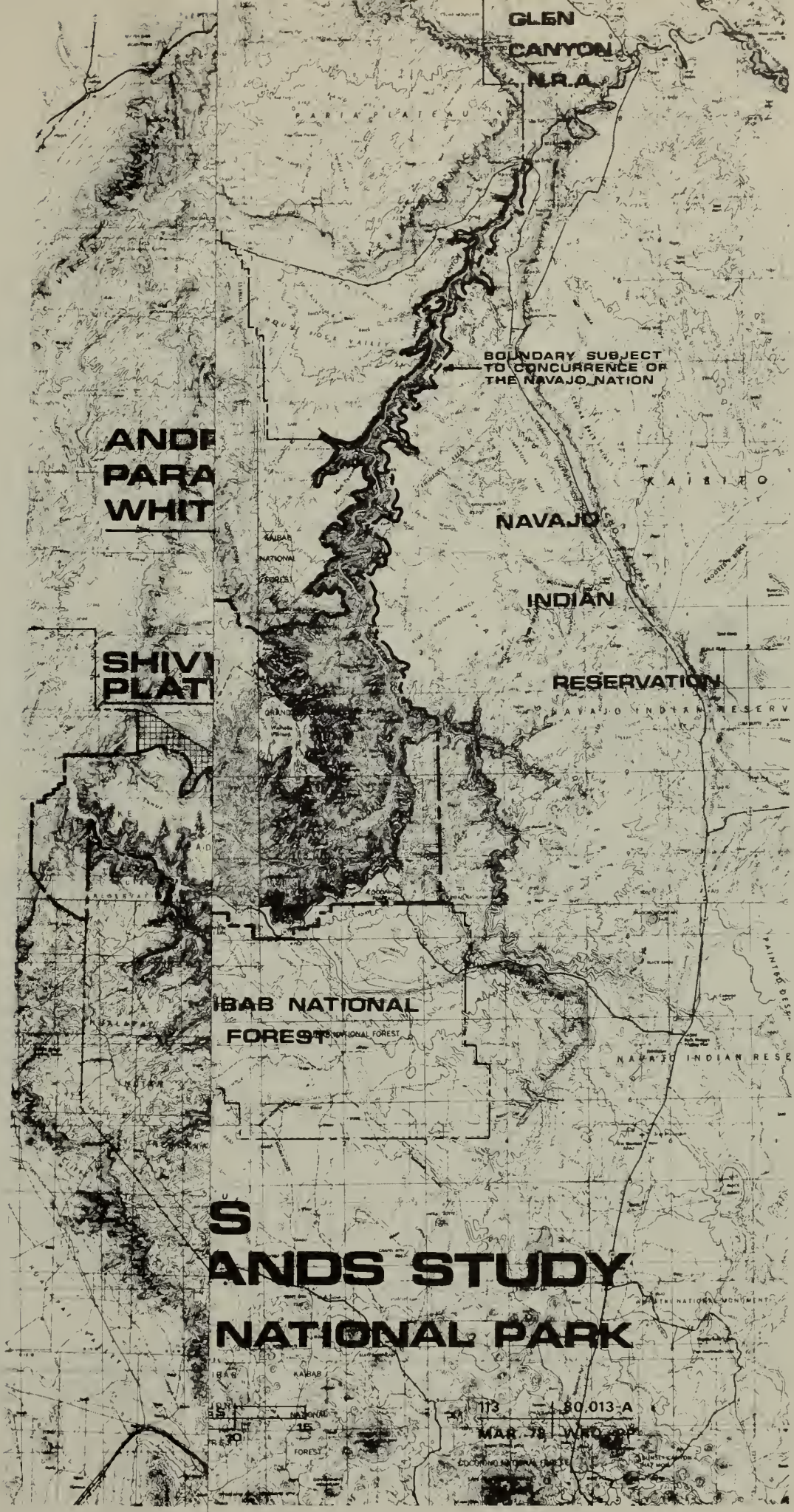
(1) That portion of Kanab Creek/Canyon north of Grand Canyon National Park including one mile back from the rims.

(2) That portion of Andrus/Parashant/Whitmore Canyons north of Grand Canyon National Park including one mile back from the rims.

(3) The remaining lands on the Shivwits Plateau in Lake Mead National Recreation Area including the area around Snap Point.

While private and state lands exist within the designated areas, the vast majority is public land under the administrative jurisdiction of the three Federal agencies involved. Acreage in each category is as follows:

National Park Service	170,000 acres
Lake Mead National Recreation Area (includes: private lands - - 1,600 acres) state lands - - 1,300 acres)	
Bureau of Land Management	160,000 acres
Arizona Strip District (includes: private lands - - 8,300 acres) state lands - - 4,200)	
U.S. Forest Service	70,000 acres
Kaibab National Forest (Includes: private lands - - 200 acres)	
TOTAL	400,000 acres


GLEN
CANYON
N.R.A.
BOUNDARY SUBJECT
TO CONCURRENCE OF
THE NAVAJO NATION
ANDE
PARA
WHIT
NAVAJO
INDIAN
RESERVATION
SHIVI
PLAT
KAIBAB
NATIONAL
FOREST
S
ANDS STUDY
NATIONAL PARK
113
80,013-A
MAR. 78

KAIBAB INDIAN RESERVATION

GLEN CANYON N.R.A.

KANAB CANYON

KAIBAB NATIONAL FOREST

BOUNDARY SUBJECT TO CONCURRENCE OF THE NAVAJO NATION

ANDRUS, PARASHANT & WHITMORE CANYONS

NAVAJO INDIAN RESERVATION

GRAND CANYON NATIONAL PARK

SHIVWITS PLATEAU

HAVASUPAI INDIAN RESERVATION

HUALAPAI INDIAN RESERVATION

KAIBAB NATIONAL FOREST

FIGURE 1

STUDY AREAS ADJACENT LANDS STUDY

GRAND CANYON NATIONAL PARK

NORTH

MILES 0 5 10 15 20

113 80,013-A

MAR. 78 WASO-DSP

After preliminary field reconnaissance of the study areas by various team members from the three agencies, a task directive for the study was prepared. This document identified the problems and issues to be addressed and defined the focus, magnitude, components and scheduling of the study to be accomplished.

Public Input

Public workshops were held the week of December 12-15, 1977, on the Draft Task Directive. Locations of the workshops were Tucson, Arizona (December 12); Flagstaff, Arizona (December 13); Phoenix, Arizona (December 14); and St. George, Utah (December 15). All workshops were well attended and informative, and public interest in the study remained high. Written comments and opinions relating to the study were extensive and continue to be recorded.

It was hoped that public involvement could be obtained at this stage of the planning process in order to assist the study team in defining their procedures and identifying specific problem areas to be addressed in the study.

The issues raised centered, for the most part, on the subject of "multiple use" as practiced by the Bureau of Land Management and the U.S. Forest Service, as opposed to the preservation of resources mandated by National Park Service administration of lands. In this regard, there was a high degree of concern expressed by interest groups representing sport hunting and grazing in the study area. Sport hunting interests dominated the Tucson, Flagstaff, and Phoenix workshops, while grazing rights were the overwhelming topic of the St. George workshop. The basic concern of these individuals and organizations was that if Grand Canyon National Park were expanded into public lands historically used for sport hunting and grazing, these uses would be precluded in the future.

Written comments have also consistently echoed the desire of hunters, wildlife groups, and local ranchers to maintain multiple use designation on the lands in the study area.

As a result of this input, it was acknowledged by the study team that big game trophy hunting is an important recreational use of the study area to be considered during the evaluation of resources portions of the study. Grazing as a land use in the study area and the rights of grazing allottees are also very important factors which will affect the management options formulated.

Another significant factor emerging from these public workshops was a decision to broaden the scope or intent of the study. A strict interpretation of the Conference Report accompanying the Grand Canyon Enlargement Act would indicate that the Committee of Conference wanted these lands to be studied only to determine if they qualified for national park designation. A more equitable concept would be to determine their resource values, the management needs of those resources, and which is the appropriate land management agency to satisfy those needs.

Much useful information was recorded both from the workshops and in written correspondence. This includes data on subjects such as grazing economics, wildlife values, land use, and potential contacts for resource information.

Data Accumulation

The next step accomplished in the planning process was the data accumulation phase of the study. This included field work by the study team, collecting and categorizing existing resource information pertaining to the study area, and requesting additional resource data, as necessary, through qualified individuals and organizations. Additional field reconnaissance was accomplished during this phase of the study. Team members representing all three agencies jointly visited the Kanab Creek Canyon, Andrus/Parashant/ Whitmore Canyon, and Shivwits Plateau portions of the study area over a four-day period. Air reconnaissance by helicopter of the entire area was also accomplished by the study team at that time.

DESCRIPTION AND EVALUATION OF RESOURCES

The analysis and evaluation of resources forms the heart of this report. It provides the information necessary to make recommendations for management of the study area lands.

The natural, cultural, and recreational resources of these lands have been described and evaluated to determine their national significance, their management needs, and their role in maintaining the integrity of the significant features contained within Grand Canyon National Park. This included the Grand Canyon itself, its tributary canyons and adjacent plateaus. In addition, these lands were evaluated to determine their existing and potential land use primarily for commercial uses including grazing, timber harvesting, and mining, and for recreation, especially sport hunting. The National Park Service criteria for natural areas were the basic guidelines used to evaluate the national significance of these resources and their relationship to Grand Canyon National Park.

The policy statements of each agency, both general and specific in regard to their present management practices in the study area, are included as an appendix to this report.

THE GRAND CANYON REGION

The Colorado Plateau is a vast, arid land of raised plains and desert basins dramatically cut by the deep gorge of the Grand Canyon across northwestern Arizona. The higher elevations of the plateau are forested, the lower elevations are a series of desert basins. Six of the seven recognized climatic and life zones are found within the region; five of them are within Grand Canyon National Park.

Approximately one half of the lands of the Colorado Plateau are Federally owned and administered. Other lands are owned primarily by Indians. The vast open spaces are only occasionally dotted with tiny settlements.

This is the home of the Havasupai, Hopi, Hualapai, Navajo, and Paiute Indian Tribes. A myriad of recorded prehistoric sites in the National Park attest to the past occupation of the canyon and its plateaus. The Kayenta, Virgin Branch of the Kayenta, and Cohonina cultural groups came together here and left evidence of their boundaries and relationships.

Today the Grand Canyon draws nearly three million visitors each year and is a dominant natural and economic feature in northern Arizona. South of the canyon are Flagstaff and the growing Phoenix/Tucson metropolitan area. To the north lies the almost uninhabited Arizona Strip where the study areas are located; beyond are the ranching communities of southern Utah.



113	80,018
SEPT 80	WRO-PP



FIGURE 2

GRAND CANYDN REGIDN ADJACENT LAND STUDY

GRAND CANYON NATIONAL PARK

113	80,018
SEPT 80	WRO-PP

THE ARIZONA STRIP

The study areas are all located within the geographic area known as the Arizona Strip. The Strip, including the northern part of Arizona's Mohave and Coconino Counties, is bounded on the north by the Utah State line, on the west by the Nevada State line, and on the south and east by the Colorado River. The area can generally be described as lightly populated with little economic diversity.

Land Status

The primary use of the Arizona Strip's approximate five million acres is as natural resource lands. The National Park Service, the Bureau of Land Management, the Bureau of Indian Affairs, and the U.S. Forest Service are responsible for managing 94 percent of the Strip land. Lands under private ownership represent three percent of the area, or 154,000 acres. Private lands are concentrated along the limited access routes of the area. State school grant sections create a checkerboard pattern throughout the Strip, and encompass another three percent of the land base.

Population

The population of the Arizona Strip is generally sparse--a reflection on land ownership and status. The 1970 population was estimated to be 2,150 residents with 1,200 people located in Fredonia, the only incorporated community in the Arizona Strip. The remainder of the population is concentrated in Colorado City, Jacobs Lake, along Interstate 15, and along U.S. 894 in House Rock Valley. The permanent population has not increased significantly since 1970, due to the limited economic opportunities and resulting out-migration. The closest urbanized area (defined as population of 2,500 or more) is St. George, Utah, with a 1970 population of 7,094. St. George is located six linear miles north of the Arizona/Utah State line. The population of St. George is expected to have increased significantly since 1970 with the completion of Interstate 15.

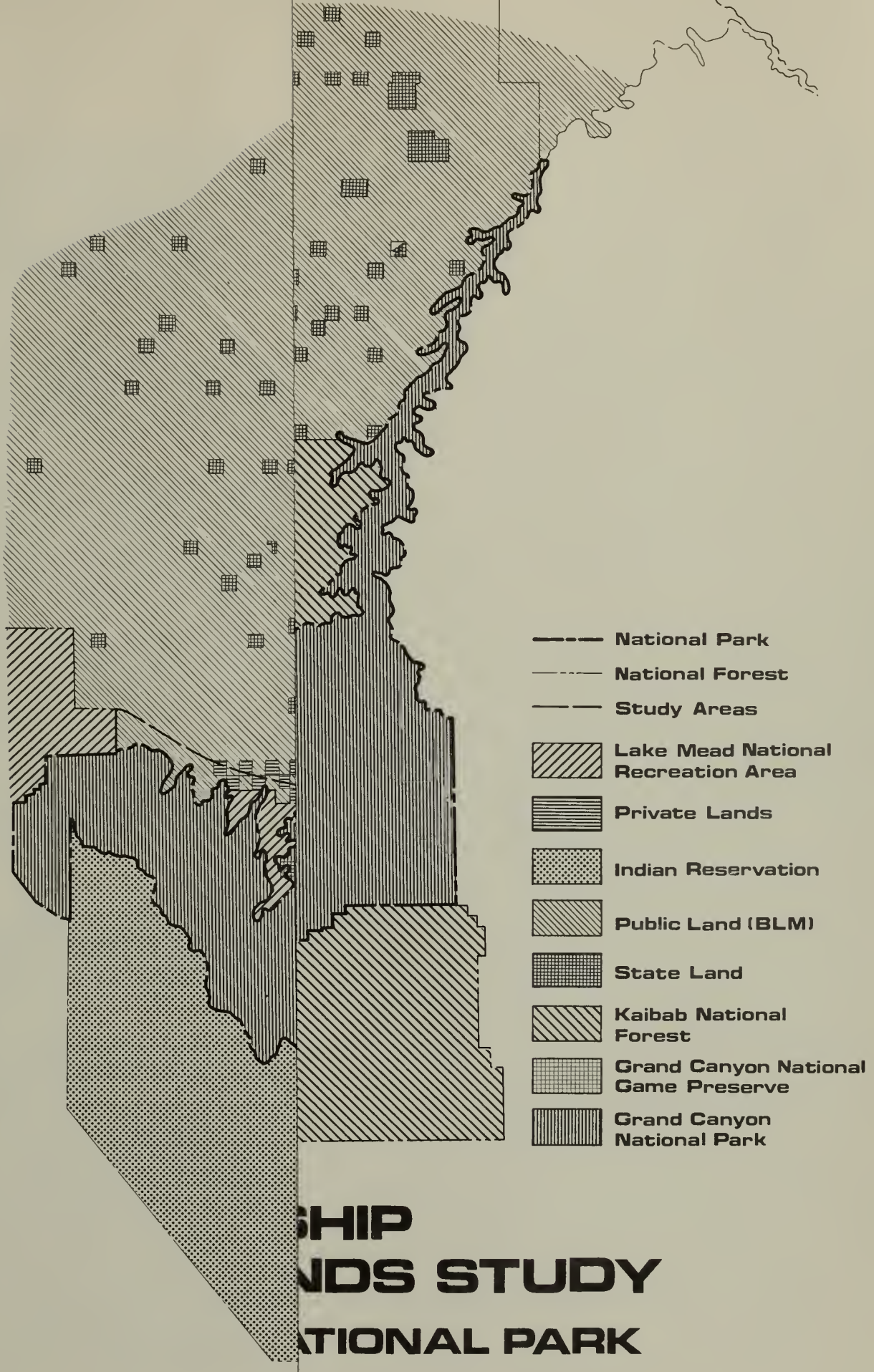
Access

Access through the Arizona Strip to the study area is limited to graded dirt roads or jeep trails. All roads require regular maintenance to provide continued access to Andrus, Parashant and Whitmore Canyons and the Lake Mead Shivwits Plateau study areas. There is no road access into Kanab Canyon itself and movement in and out of this rugged canyon is restricted to horseback and by foot.

Wet weather can be a hazard restricting travel from several hours to weeks at a time depending on the season. Heavy winter storms have blocked access on the Strip for up to 30 days in elevations above 4,000 feet.

Economic Indicators

Economic activity in the Arizona Strip is currently limited to a few select types, primarily livestock grazing, timber harvesting and services. Commercial timber within the Strip exists in the Kaibab National Forest east of the



SHIP
NDS STUDY
ATIONAL PARK

16

113	80,019
SEPT 80	WRO-PP

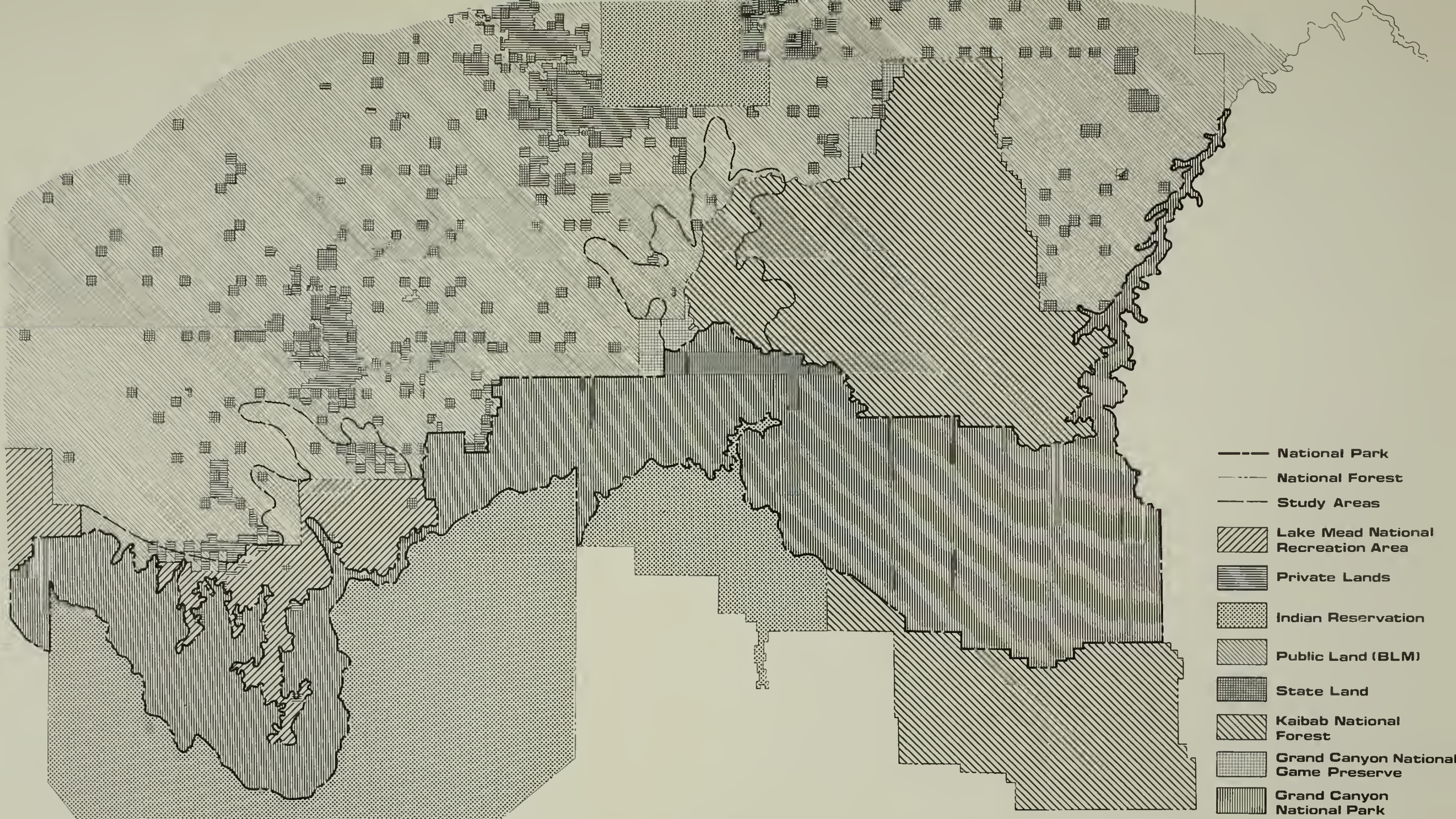


FIGURE 3

LAND OWNERSHIP ADJACENT LANDS STUDY

GRAND CANYON NATIONAL PARK

113	80,019
SEPT 80	WRO-PP

study areas on lands above 6,000 feet in elevation. Agricultual activities are limited by the almost universal lack of water. Dry-land farming was attempted in the 1920's on the Strip, but proved unsuccessful. Current agricultural activity is located near perennial water sources that can be used for irrigation, such as the Virgin River Basin. There is potential for expansion in the recreation and service sectors associated with accommodating visitors to the region's natural attractions.

Big game hunting draws the largest single group of visitors to the Arizona Strip and the study area vicinity. These plateau lands generally harbor substantial populations of mule deer, the quarry of the majority of hunters. Most hunters come from the populated areas of southern Arizona. Only about 15 percent of those hunting big game are from out-of-State.

Mineral extraction activities on the Strip have historically been small scale operations and very sporadic, with limited quantities of mineral production beginning in the late 1880's. The only minerals having any record of significant production to date from the area are copper and more recently uranium. Interest in copper mine properties as well as uranium are recurrent. However, no significant production has occurred recently.

The dominant economic activity is livestock grazing. Cattle ranching is the major use of the area along with some sheep grazing. Cattle ranching on the Strip is a major economic force in Washington and Kane Counties in Utah as well as Coconino and Mohave Counties in Arizona.

Almost all ranch operators in the area live in towns and villages as did the early colonizers. Seasonal inaccessibility of the area and the inability, economically, to reside in these remote areas are important factors influencing the residency of the Arizona Strip ranching community.

Climate

The Grand Canyon region, including the Arizona Strip, has a variety of climates depending mainly on elevation. Average annual precipitation varies from more than 25 inches along the forested high plateau portions of the north rim to less than 10 inches in the desert areas of the lower inner canyon.

The seasonal distribution of moisture on the north rim is one of heavier summer and winter precipitation with August and January being the wettest months. The spring and fall are relatively dry in all areas. Summer precipitation usually falls from thunderstorms that form over the heated canyon walls almost every afternoon from early July until September. Winter precipitation is not as consistent. It varies greatly from year to year and is dependent upon middle latitude Pacific Ocean storms. Practically all of the winter precipitation at higher elevations of the plateau occurs as snow. Average annual accumulation on the Kaibab Plateau is 150 inches. Snowfall is a rarity in the lower elevations of the inner canyon.

Summer months are typically hot with daily temperatures ranging between highs in excess of 100 to lows in the 60's. Although winter is cold and average daily lows are in the low 20's, highs in the 50's are not uncommon. Again, elevation plays a major part in temperatures experienced at a particular location.

History

The first non-Indians to view the Arizona Strip country probably were early explorers and missionary priests during the period of Spanish rule. The Virgin River valley to the northwest was an important route for exploration and travel--the old Spanish Trail followed the Virgin Valley. Padre Escalante in 1776 came south here from the St. George area then turned east on his return trip. Following the incursion of the Spanish into the Arizona Strip, the next major exploration was not until John Wesley Powell and his associates explored the Colorado River in 1869 and 1871.

The early history of the Arizona Strip country as a whole began with the Church of Jesus Christ of Latter Day Saints. Jedediah Smith passed through the region in 1826 and 1827.

Santa Clara, St. George and other towns in southern Utah were founded soon after Salt Lake, as the Mormons began to consolidate their position in Utah. These farming communities prospered along the Virgin River in the last part of the 19th century. Members of exploring hunting parties from these settlements were perhaps the first white people to explore the Strip itself.

The Mormons first began to utilize the Arizona Strip in the mid-1860's when a sawmill on Mt. Trumbull was established to produce lumber for the temple in St. George, and cattle were brought in to provide beef for the men working in the mills. Mt. Trumbull provided excellent summer range for cattle, but when the snows came, range was sought in the lower valleys to the east and west of the mountain. In 1871 the mill was shut down and the church removed its herds, but several of the one-time lumbermen who had taken part in the stock-growing stayed in the area to tend their newly acquired herds. Many farming and ranching families were introduced to stock-growing during this period and gained prominence as cattlemen. Their descendants continue this tradition. Cattle ranching is a predominant contributor to the economic health of southern Utah and northwestern Arizona today.

At the turn of the century the largest change to ever affect the Strip took place with the coming of the sheepmen. Perhaps the first herd of sheep to winter on the Strip was brought in 1905. Around 1915 transient herds began to find their way down on the Strip. Most of these came from Utah entering late in the fall and making a large circle down to where the feed was best and adequate water was found. By the 1920's perhaps half a million head of transient sheep were wintering in the Arizona Strip. In this same period cattle ranches had built up their herds on the Strip country. Conflicts over rangeland and the limited amount of forage for stock in this naturally arid country were inevitable. Local rangers became increasingly alarmed at the condition of the range caused by excessive grazing and competition for forage by sheep and cattle. Ensuing battles over rights to water tanks created further controversy. The enactment of the Taylor Grazing Act in 1934 put an end to the open range and established grazing allotments based on prior use of water rights to existing tanks.

Poor markets and predation caused a rapid decline in sheep herding throughout the 1940's and gradually sheep were phased out in favor of cattle. Today, through a series of management practices on public lands, the evidence of the intense grazing pressures of the past are slowly healing with the passage of time.

VEGETATION

The Arizona Strip is located in a southern extension of the cold temperate Great Basin Desert, but it also contains vegetative components of the warm Sonoran Desert better developed to the south.

High temperatures, relatively small amount and distribution of precipitation during the growing season, and the poor moisture-holding capacity of the soils are the environmental factors which produce the vegetative associations of this part of Arizona.

Within the study areas, the vegetation varies mainly due to elevation changes which affect both precipitation and temperature. The vegetation of the Upper Sonoran Life Zone predominates. However, intrusions of species more commonly associated with the Lower Sonoran Life Zone do appear in canyons in some of the lower elevations. Occasionally, isolated areas of Transition Life Zone vegetation occur at higher elevations. The range from canyon bottom to above-rim plateau includes a wide variety of vegetative types, some merging with one another to an extent that they are indistinguishable. In addition, aggressive exotic plants such as tumbleweed and cheatgrass have invaded some native plant communities and are dominant where past grazing pressures have been heavy.

Table 1 lists life zones and associated vegetation communities found in the study area.

TABLE 1

LIFE ZONES

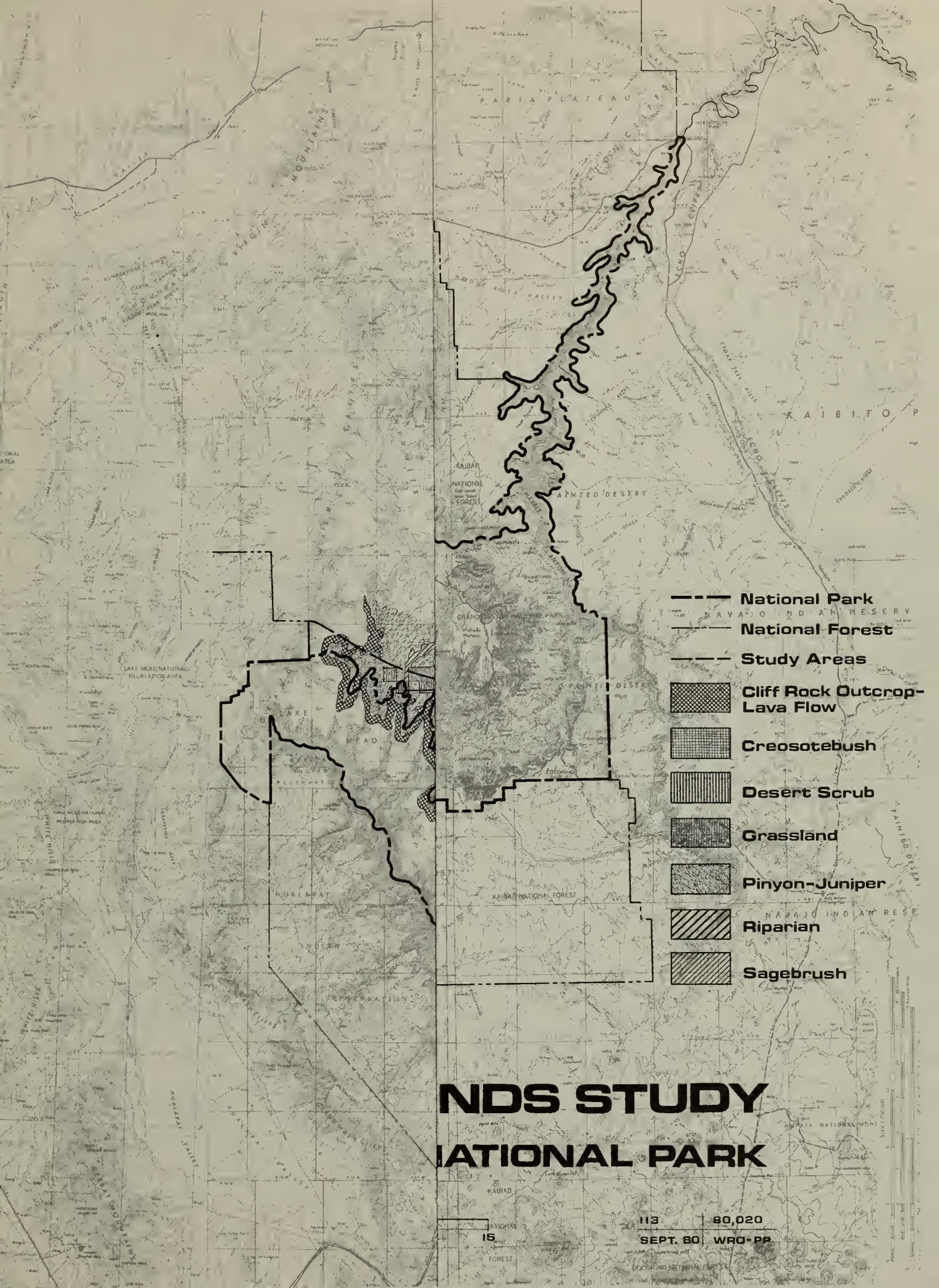
Lower Sonoran Life Zone -- 2,000-3,500' elevation
- Riparian Community (dry canyon floors)
- Creosotebush Community (2,000 - 3,500')
- Cliff Rock Community (inner gorge/esplanade)

Upper Sonoran Life Zone -- 2,000-6,500' elevation
- Riparian Community (wet canyon floors)
- Desert Shrub Community (3,000-5,000')
- Sage Brush Community (3,000-4,500')
- Grassland Community (4,000-5,000')
- Pinyon-Juniper Community (4,500-6,500')
- Cliff Rock Community (esplanade/upper cliffs)

Transition Life Zone -- 6,000-8,000' elevation
- Ponderosa Pine Community

Riparian

Rabbitbrush and other species associated with washes and disturbed habitats dominate the floodplains of major washes in the canyons. Scattered tamarix, cat-claw acacia and Fremont's barberry lend a wooded appearance to these intermittent watercourses. Where moisture conditions prevail at the bottom of streambeds, plants such as cottonwood and desert willow can be found.


National Park
National Forest
Study Areas
Cliff Rock Outcrop-Lava Flow
Creosotebush
Desert Scrub
Grassland
Pinyon-Juniper
Riparian
Sagebrush
NDS STUDY
IATIONAL PARK
113
80,020
SEPT. 80
WRO-PR
PARIA PLATEAU
KAIBAB NATIONAL FOREST
PAINTED DESERT
LAKE MEAD NATIONAL RECREATION AREA
NAVAJO INDIAN RESERV
KAIBAB

National Park
National Forest
Study Areas
Cliff Rock Outcrop-Lava Flow
Creosotebush
Desert Scrub
Grassland
Pinyon-Juniper
Riparian
Sagebrush

FIGURE 4

VEGETATION ADJACENT LANDS STUDY

GRAND CANYON NATIONAL PARK

NORTH

MILES
0 5 10 15

113 80,020
SEPT. 80 WRO-PP

Riparian vegetation is the rarest vegetation in the study areas, but it is valuable habitat from the standpoint of wildlife production. It provides excellent cover and the food and water sources necessary for survival.

Creosotebush

Creosotebush comprises much of the desertlike lands below 3,500 feet in elevation. Although it is the predominant plant in this association, it is interspersed with other desert-type shrubs throughout much of its range. On lower valley slopes with low relief, creosotebush and matchweed are in close association. On higher rolling slopes blackbrush joins creosotebush to form a transition community with neighboring Desert Shrub communities.

Desert Shrub

The Desert Shrub type occurs in the same general locality as creosotebush but at higher elevations (3,000 to 5,000 feet). It covers wide areas between the creosotebush and pinyon-juniper vegetative zones. Blackbush is the dominant species in this type, varying from 30 percent in composition to almost pure stands. Matchweed and banana yucca are common associates.

Sagebrush

The Sagebrush type includes big Sagebrush, Fremont's barberry, cliffrose, scattered juniper, and a variety of herbaceous species. This plant association occurs on the flat plateaus and upper rims of the study area at elevations above 3,000 feet. It merges with the pinyon-juniper association above 4,500 feet.

Grasslands

Grasslands occupy portions of flatlands and valley locations in the study area between 4,000 and 5,000 feet in elevation. Grasses common to the zone are blue grama, galleta, and Indian rice grass. Some grassland areas have been invaded by Russian thistle and burro grass which have replaced much of the representative vegetation.

Pinyon-Juniper

The Pinyon-Juniper community is prevalent on the upper rims and plateaus of the study area above 4,500 feet. This is open shrub woodland dominated by pinyon pine and Arizona juniper. The understory is composed of a mixture of forbs and grasses with some shrubs such as Sagebrush and cliffrose. It merges with the Sagebrush and Desert Shrub communities at its lower elevations. There is evidence of this plant association spreading in the area, most likely through past fire suppression efforts and grazing pressures over a prolonged period of time.

Fire is an important factor in the natural, recurring succession of plants in the Pinyon-Juniper plant community. The following diagram illustrates the changes that occur in the vegetative composition after wildfire in this plant community.

TABLE 2

I.	FIRE
II.	SKELETON FOREST (DEAD TREES) AND BASE SOIL
III.	PERENNIAL GRASS-FORB STAGE
IV.	PERENNIAL GRASS-FORB-SHRUB STAGE
V.	PERENNIAL GRASS-FORB-SHRUB-YOUNG JUNIPER STAGE
VI.	SHRUB-JUNIPER STAGE
VII.	JUNIPER WOODLAND

Cliff Rock Outcroppings

Largely devoid of vegetation and soil, this community is found on nearly vertical rocky cliffs. A few scattered plants gain footholds in crevices and soil pockets. These include Sagebrush, Fremont's barberry, and juniper.

SOILS

The soils of the study area are either volcanic in origin, formed in basalt, or they are made of residium from sedimentary rock of limestone, sandstone, and shale. They are generally shallow, low in organic matter, and loosely cemented. Their extent coincides with the geologic formations of the area and can be traced on the Geology map (Figure 5).

In general, fine to coarse alluvium fills the channel of ephemeral streams in the valley bottoms and grades into coarser colluvial material on lower canyon slopes. Deposits of deeply fractured talus and colluvial debris cloak the upper slopes at the base of canyon walls. There are large exposures of bare rock in the area, especially on lava flows, and on the esplanade.

WILDLIFE

Wildlife in the study area is varied but not abundant. Wildlife populations depend upon the quality of various habitats, their stage of ecological succession, and availability of water for their survival. Where overgrazing, wildfire prevention, and drought have altered natural habitat, some wildlife

species have been adversely affected. However, the development of permanent water sources for cattle has generally benefited wildlife populations and has definitely affected their distribution.

A sampling of the various species present is as follows:

Reptiles:

A number of reptiles can be found; the most common species include the side-blotched lizard, sagebrush lizard, desert spiny lizard, western whiptail, collared lizard, horned lizard, red racer, and western rattlesnake.

Birds:

Resident birds include the raven, cactus wren, canyon wren, sage sparrow, horned lark, pinyon jay, Gambels quail, mourning dove, red-tailed hawk, kestrel, golden eagle, marsh hawk, prairie falcon, long- and short-eared owls, and great horned owl. Merrimans turkey, a successful transplant from south of the Grand Canyon, inhabits higher elevations of the Strip where water and food sources are available. A small population exists in the Mt. Dellenbaugh portion of the study area.

Chicken partridge, a native of India, was introduced on the Strip by Arizona Game and Fish during the 1950's. This game bird now inhabits canyon drainages throughout the Strip country.

Mammals:

A number of small mammals are native to the study area. The more common bats include western pipistrelle, California myotis and eastern big-eared bat. Rodents which are common include the white-tailed antelope squirrel, rock squirrel, pinyon mouse, kangaroo rat, cactus mouse, and wood rat. Both black-tailed jackrabbit and desert cottontail are resident. Of the larger mammals, the mountain lion, coyote, gray fox, and bobcat are predators known to inhabit the area. The badger is also characteristic though uncommon.

Pronghorn antelope have been successfully reintroduced to the Arizona Strip after virtually disappearing from the area by 1940. Today, a herd of about 150 animals inhabits the Strip in the Uinkaret Plateau area.

Desert bighorn sheep are known to inhabit the study area in lower Kanab Canyon overlapping from the inner canyon regions of Grand Canyon National Park. Present and potential sheep habitat in Kanab Canyon is in fair to poor condition due mainly to past livestock grazing. Bighorn sheep are highly dependent on forage species being in good to excellent condition and cannot compete with livestock on extensively grazed lands. The upper slopes and ledge areas, which are prime sheep habitat, are fairly inaccessible to cattle and now in good condition. In addition, recent curtailment of grazing activities should encourage the reestablishment of bighorn habitat in Kanab Canyon.

Mule deer are the most important big game species in the study area. Historically, the Arizona Strip has been well-known for a consistent producer

of trophy size mule deer and the Arizona deer hunt accounts for a large part of the visitation to the study areas each year.

In 1978, approximately 3,600 deer hunters spent an average of 3.7 days hunting game management Units 12A and 13 which comprise the entire Arizona Strip (Figure 7). They harvested 713 deer for a success ratio of 20 percent.

The mule deer of the study area are dependent upon both summer and winter ranges for their survival. The summer range of this area lies above 6,000 feet on the upland plateaus and has cooler average temperatures and higher rainfall, which favors growth of important forage plants. From the standpoint of mule deer production, the perennial grass forb stage, or first stage after fire, is the most productive of succulent forage. As shrubs reinvade desirable grass species such as squirreltail, mutton grass and western wheatgrass and forbs such as penstemon, mountain dandelion, deer vetch and globe mallow are crowded out. Mature pinyon-juniper stands generally have a composition of less than five percent of these desirable species.

In winter, starting around November 1, the herds migrate to the lower plateau lands and into the canyons of the various tributary drainages of Grand Canyon to escape the heavy snows of the higher elevations. Availability of forage in winter and green forbs in early spring are the most critical elements affecting the health of the deer herd. The present condition of much of the range is fair to poor due to a combination of overgrazing, suppression of natural fires, and drought conditions. Unpalatable shrubs and trees dominate many plant communities. Consequently, deer populations are at a low point but herd productivity has increased over the last few years due to more favorable weather conditions.

Some range has been claimed and reseeded to provide better forage for deer and water improvements for livestock have benefited the resident deer population. However, in some cases fencing to facilitate livestock management and corrals around water developments have limited deer access to the water sources.

The most conspicuous exotic animal within the Grand Canyon area is the feral burro. The burro was introduced into the Canyon region in the late 1800's by early explorers and prospectors. It has become common in some areas, and the impact on the native ecosystem by this animal has been extensive. The burro also competes with native species such as the desert bighorn sheep for available food sources, usually to the detriment of the native animal population. In the past, resource managers have attempted to reduce or eliminate the burro from Grand Canyon National Park but this was halted in the late 1960's due to public pressure against this practice.

The Kaibab National Forest portions of the Kanab Creek study area are included within the Grand Canyon National Game Preserve authorized by Presidential Proclamation of November 28, 1906. The proclamation, under authority of "An Act for the Protection of Wild Animals in the Grand Canyon Forest Reserve," was signed by President Roosevelt in recognition of the area's high value as wildlife habitat.

The Kanab Canyon area serves as a key winter range for the North Kaibab Mule Deer herd within the Grand Canyon National Game Preserve. It is important to other species of wildlife also. The rim of Kanab Creek and Sowats Canyon has an area known as "The Points" habitat that experiences a significant amount of deer use during the winter months. Deer use on the winter range is approximately from November through March (five months) depending on snow conditions on the summer range.

BIOLOGICAL EVALUATION

The Grand Canyon region is a complicated ecosystem that has evolved through geologic time in response to climatic conditions and physical factors such as elevation and available moisture. The plateaus and canyons of study areas are an integral part of that ecosystem. Within this environment there are habitats or communities where countless interactions between organisms and their environment are continually occurring. For the most part, these communities are not sharply defined and biological boundaries are indistinct--with plant and animal species of different communities existing side by side.

The biological communities of the study area are intrinsically associated with Grand Canyon itself. The plant and animal life of these communities cannot be separated or considered distinct from those of the surrounding lands which have similar environmental characteristics.

A notable exception is the highly distinct riparian vegetation occurring in perennial and intermittent stream bottoms, reservoirs, springs, and water seeps. This habitat is the rarest but most critical in this arid climate. Regardless of animal species, riparian vegetation is the most valuable wildlife habitat in Arizona. Here native species can find water and important varieties of cover and food elements. Riparian communities exist in the bottom of the Kanab Canyon drainage system as well as in scattered locations in Andrus, Parashant and Whitmore Canyons. They warrant management protection to accelerate their recovery and maintain their integrity.

It is not known whether any rare or endangered plant or animal species is dependent upon the study area lands for survival. These biological communities do not individually possess exceptional value or quality with regard to National Park Service criteria for national significance of natural areas. However, they are part of the entire Grand Canyon ecosystem and they do play a role as buffer for the nationally significant features in Grand Canyon National Park.

PHYSIOGRAPHY/GEOLOGY

General

The upper plateaus of the Arizona Strip or north rim country are mostly gently-rolling, dissected tableland, with a number of lava-capped buttes rising above the general landscape. Lava flows cover large areas of the southern parts of the Strip. By contrast, at the lower edge of the plateau, which borders the Colorado River in the Kanab Creek/Andrus/Parashant/Whitmore Canyon study areas, the extremely rugged, precipitous terrain typical of the

Grand Canyon emerges. These major tributaries to the Grand Canyon provide classic examples of landscape development in nearly horizontal sedimentary rock of varying resistance to erosion.

The history of the geological formations exposed through erosion in the Grand Canyon has been well studied and documented because of their visibility. Faulting has also exerted a significant control on the structural development and geomorphic history of the central-western Grand Canyon area, including the study areas. The major structural features responsible for the vertical and lateral changes that have occurred here are the Grand Wash, Hurricane and Toroweap fault system. Each of these faults trends generally north-south and is upthrown to the east. These faults are evidenced by prominent scarps which range from 200 to several thousand feet. The Hurricane and Toroweap faults are believed to be still active. Cenozoic lava flows have crossed these faults and subsequently been displaced providing an unusually good record of recent earth movement. Volcanic eruptions have occurred numerous times within the last six million years. These volcanic rocks are exposed in many parts of Whitmore Canyon and on the Shivwits Plateau parts of the study area.

Figure 5 shows the distribution of faults and basaltic lava flows in the western Grand Canyon area.

Shivwits Plateau

The Shivwits Plateau study area forms the western end of the north rim of the Grand Canyon. It averages 6,000 feet in elevation with Mt. Dellenbaugh being its highest point (6,900 feet). Maximum change in elevation is approximately 2,000 feet.

The configuration of the plateau here is that of a series of long, narrow, relatively unaccessible peninsulas of land trending southward. The longest, terminating at Kelly Point, is the southernmost extension of the north rim of the Grand Canyon. The canyon surrounds the plateau on three sides at this point, and to a lesser degree, around adjacent north-south trending extensions of the plateau to the west. These extensions of the southern Shivwits were created by the erosional forces of the Colorado River and its tributary drainages of Surprise/Green Springs Canyons, Twin Springs Canyon, Burnt Springs Canyon, and Tincanebits Canyons.

The basic rock of the Shivwits Plateau study area is the Permian Kaibab limestone which forms the upper rims of the Grand Canyon throughout its entire length and forms the northern boundary of Grand Canyon National Park at this point. Chert nodules and fossils of crinoids and brachiopods are locally abundant in this formation.

Quarternary basalt overlies the Kaibab limestone throughout the relatively flat plateau surface. Mt. Dellenbaugh and Blue Mountain near the southern tip of the plateau are composed of this basalt, as is Snap Point at the western edge of the plateau.

As elsewhere along the north rim, springs occur under the rim where aquifers have been exposed by erosion. Twin Springs and Green Springs are typical examples.

LEGEND



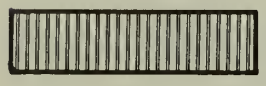
VOLCANIC ROCKS—BASALTIC FLOWS, AGGLOMERATE, TUFF AND CINDERS. **QTb**



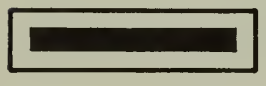
SEDIMENTARY DEPOSITS—MAINLY ALLUVIAL GRAVEL, SAND, AND SILT IN FLOOD PLAINS, TERRACES, FANS, AND PEDIMENT CAPPINGS. LOCALLY INCLUDES DUNE SAND, LAKE DEPOSITS, AND LANDSLIDE MASSES. **Qs**



MOENKOPI FORMATION **TRm**



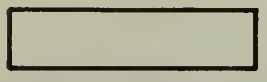
KAIBAB LIMESTONE AND TOROWEAP FORMATION **Pkt**



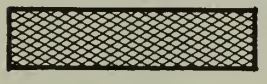
COCONINO SANDSTONE **Pc**



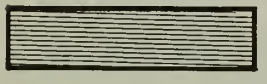
HERMIT SHALE **Ph**



SUPAI FORMATION **PLPs**



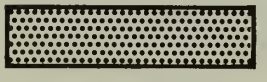
PAKOON LIMESTONE (PERMIAN) AND CALLVILLE LIME-STONE (PENNSYLVANIAN) OF McNAIR (1951) UNDIVIDED. **PLPc**



SEDIMENTARY ROCKS—REDWALL LIMESTONE MISSISSIP-PIAN) AND TEMPLE BUTTE LIMESTONE (DEVONIAN). **MDs**



SEDIMENTARY ROCKS—TONTO GROUP (MIDDLE AND LOWER CAMBRIAN) BRIGHT ANGEL SHALE, TAPEATS SANDSTONE AND MUAV LIMESTONE. **O€s**



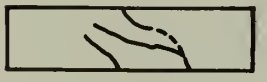
GRAND CANYON SERIES. INCLUDES CHUAR AND UNKAR GROUPS. **p€g**



INTRUSIVE ROCKS, GRANITE, QUARTZ, MONZONITE, GRANODIORITE, AND QUARTZ DIORITE. **p€gr**



METAMORPHOSED SEDIMENTARY AND VOLCANIC ROCKS, INCLUDES VISHNU SCHIST IN GRAND CANYON. **p€sc**



FAULT LINES

STUDY AREA BOUNDARY

PARK BOUNDARY


OGY
CENT LANDS STUDY
CANYON NATIONAL PARK
MILES
5
10
15
113
80,021
SEPT 80
WRO-PP

FIGURE 5

GEOLOGY
ADJACENT LANDS STUDY

GRAND CANYON NATIONAL PARK

MILES
0 5 10 15

113 | 80,021
SEPT 80 | AWRO-PP

Andrus-Parashant-Whitmore Canyons

The Andrus/Parashant/Whitmore Canyon study areas are north of the Colorado River on the edge of the Shivwits Plateau at its juncture with the Uinkaret Plateau. This rugged canyon complex is deeply incised into the Shivwits and drains its southeastern margin into the Colorado River as a major tributary system to the Grand Canyon. Within this portion of the study area there is a total elevation change of 2,500 feet.

The profile is that of three parallel canyons within a canyon system. The elevation rises from 1,600 feet at the river near Whitmore Rapids to 6,012 feet on the plateau rim in a lateral distance of only four miles. The sharp rise of the inner canyon is broken at the redwall edge by the broad bench of the Esplanade at an elevation of 3,200 to 3,400 feet. The upper cliffs then rise sharply to the plateau's surface from the upper end of the esplanade bench. The vegetation is scanty, rock exposures predominate, and access is most difficult to Andrus and Parashant Canyons.

Spectacular volcanic flows are present in this portion of the study area along the Grand Canyon National Park-Lake Mead National Recreation Area boundary. Cascades of lava have poured into Grand Canyon from the mouth of Toroweap Valley and into Whitmore Canyon from the highlands of the Uinkaret Plateau to the northeast. All of the flows exposed in Whitmore Canyon were recently extruded onto the present erosion surface of the esplanade and are essentially unmodified by erosion and weathering.

The formations exposed over geologic time in this portion of the study area are: 1) the Kaibab/Toroweap limestone of the plateau at its southern edge at the upper canyon rim; 2) the Coconino sandstone of the upper cliffs; 3) Hermit shale and Supi sandstone of the esplanade; 4) the Redwall which at this point forms the northern boundary of Grand Canyon National Park. The redwall is one of the most prominent formations throughout the entire length of the Grand Canyon. In addition, upper Whitmore Canyon, called Whitmore Wash, is filled up to the level of the esplanade with interbedded alluvium deposits. Figure 6 delineates the typical stratigraphy and geologic age of the formations as found in the Parashant/Whitmore Canyon area.

Kanab Canyon

Kanab Canyon forms the largest tributary drainage system on the north rim of the Grand Canyon. Erosional forces have deeply entrenched Kanab Canyon into the landscape and highly dissected the bordering uplands of the Kanab Plateau to the west and the Kaibab Plateau to the east. The Kanab Creek drainage system is several thousand square miles in extent and the study area is a small, although dramatic, part of that drainage system. The main canyon and its major tributaries of Hack Canyon, Snake Gulch, Jumpup Canyon and Sowats Canyon consist of a series of steep to vertical canyon walls and cliffs and gently sloping benchlands and canyon bottoms. Even to a greater extent than in Andrus/Parashant/Whitmore Canyons, the impression here is one of a series of canyons within a major canyon system.

The geologic formations encountered belong to the Paleozoic period. In ascending order from the Grand Canyon National Park boundary, they are:

SUMMARY OF THE PARASHANT - WHITMORE AREA STRATIGRAPHY

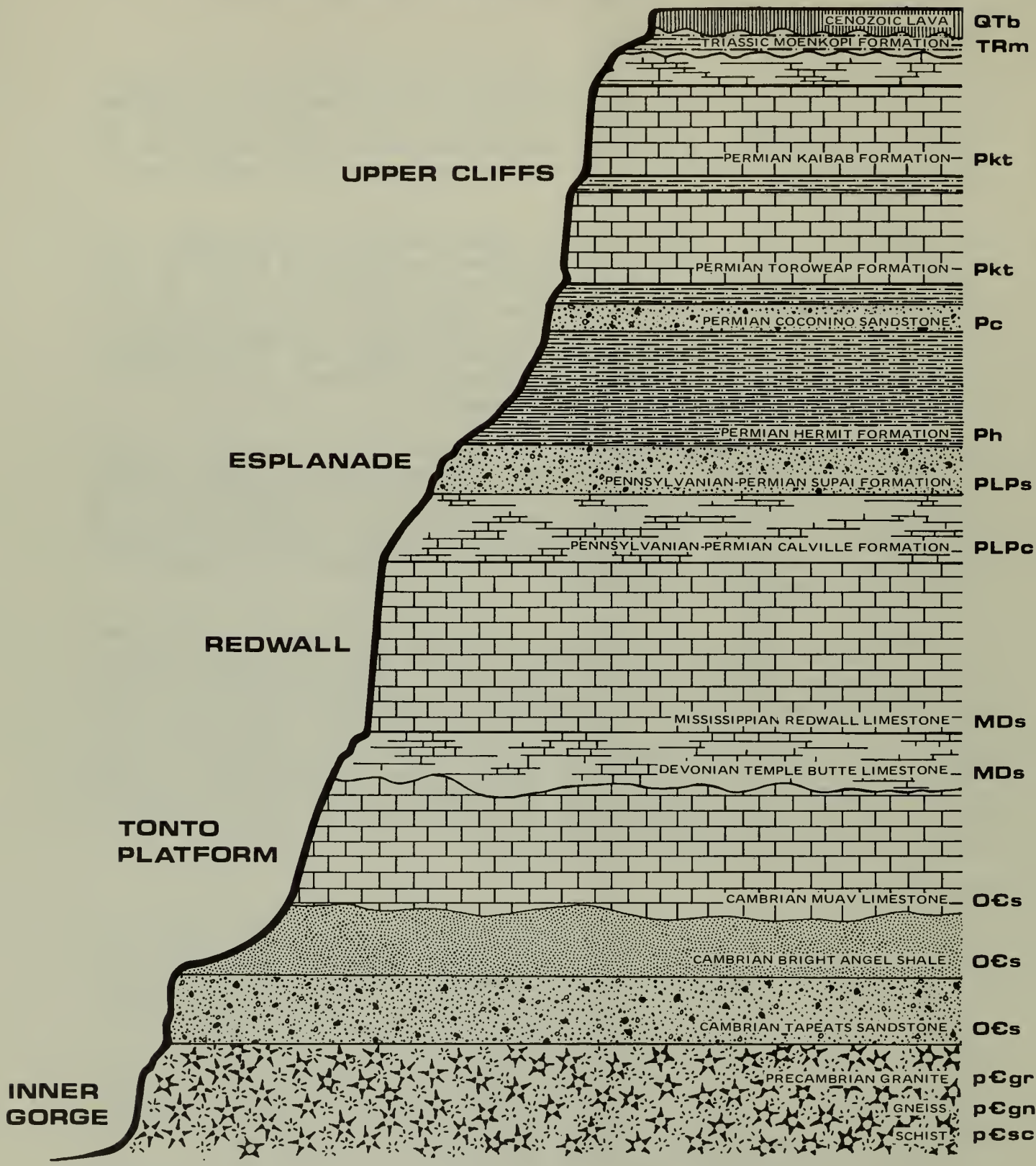


FIGURE 6

1. Mississippian Redwall limestone
2. Supi formation
3. Hermit shale
4. Coconino sandstone
5. Toroweap limestone
6. Kaibab limestone

In Kanab Creek all six formations play a role in forming the canyon walls and side slopes at various elevations. The canyon bottoms however, are confined in order of ascending elevation north from the park boundary to: redwall limestone, the Supi formation (the major canyon bottom formation) and hermit shale in the upper reaches and in Snake Gulch.

The area is subject to periods of local high-intensity storms with resultant flash floods in the canyons alternating with long periods of drought. Erosion of bedrock is intense during this period of high runoff with existing alluvial deposits drastically altered and vegetative cover removed.

GEOLOGIC EVALUATION

From a scientific standpoint, the geological features of the study area are their most significant attributes and are valuable adjuncts to the geological features in Grand Canyon National Park. The study areas' link to Grand Canyon through associated sedimentary deposits is obvious. The Kaibab/Toroweaps limestone cliffs are acknowledged to be the general upper rim of the entire Grand Canyon of the Colorado River. This formation is prevalent throughout the study areas and defines the upper rim of Kanab Canyon and its tributaries, all of Andrus-Parashant Canyons, a portion of Whitmore Canyon, and the entire southern edge of the Shivwits Plateau in Lake Mead NRA including Snap Point.

The basalt rock cap of the Shivwits Plateau study area contains Cenozoic lava flows of the oldest type found in the Grand Canyon area. In contrast, the lava flows in Whitmore Canyon at the eastern edge of the study area were deposited during the most recent volcanic activity of that era and are linked in geologic time to the dramatic lava flows and cinder cones at the mouth of Toroweap Valley directly to the east in Grand Canyon National Park. The broad expanse of the esplande at the mouth of Andrus/Parashant/Whitmore Canyons and visible in Kanab Canyon is an integral part of the inner portions of Grand Canyon. This feature is composed of the Supi sandstone and hermit shale formations which are highly significant and dominant geologic features throughout Grand Canyon National Park. This includes the extensive Sanup Plateau to the west, added to the park as a result of the Grand Canyon National Park Enlargement Act of 1975.

SCENIC RESOURCES

Visually, the flat plateau land of the Arizona Strip with its mantle of vegetation contrasts sharply with the relatively barren, vertical landscape of the Grand Canyon and its tributaries at its southern extremity. This contrast

is further heightened when the viewer suddenly encounters the steep verticality of the canyon environment after traveling through many miles of horizontal plateau land.

Each of the three portions of the study area offers distinct scenic viewing experiences. The Shivwits Plateau affords a variety of spectacular views of the western Grand Canyon from a series of south-trending peninsular mesas. These mesas provide a unique viewing platform for the western end of Grand Canyon that is not available elsewhere. The esplanade, the distinctive outer canyon formation consisting of great expanses of sandstone slickrock dotted with potholes and agave, is dramatically present here. This landscape feature is not as visible from south rim locations.

The Andrus/Whitmore/Parashant canyon landscape is a colorful companion drainage link to Grand Canyon proper. The broad esplanade surface at the mouth of Andrus and Parashant Canyons is deeply incised at its southern edge where the two canyons join and drain into the Grand Canyon. From Whitmore Point, the esplanade is a broad expanse viewed as a low mesa that ends abruptly and drops sharply into the inner canyon of Grand Canyon. In addition, the spectacular lava flows extruded onto the esplanade in Whitmore Canyon from the bordering Uinkaret Plateau provide a dramatic backdrop to the panorama.

The Kanab Canyon study area is a vast, rugged and primitive system of colorful canyons and geological formations, spectacular vistas and natural beauty. The canyon's geological formations, erosional characteristics, and physiographic features are linked to and are virtually identical to the Grand Canyon of the Colorado River on a smaller scale. Numerous locations on the plateau lands surrounding the upper rim of Kanab Canyon offer views of the steep-sided canyon walls, benchlands, and riparian canyon bottoms, and their association with Grand Canyon proper to the south.

PHYSIOGRAPHIC/SCENIC EVALUATION

There can be no doubt that the study area lands are physically and visually linked to the Grand Canyon of the Colorado River. The rugged canyons drain south directly into the Colorado River and the surrounding plateau lands forming rims of the tributary canyons also form a significant part of the upper north rim of the Grand Canyon.

The scenic qualities of the study areas are integrated with and lend additional diversity to the viewing experiences present at Grand Canyon National Park. The plateaus function as viewing platforms for the canyons in the study area and of Grand Canyon itself. The most notable characteristic common to all the study areas is a spaciousness and a feeling of isolation derived from a lack of development, distance from urbanization, and the primitive nature of the access roads.

To the visitor, the physiographic characteristics and scenic values of the study areas are one of their most outstanding features. These values increase and become more dramatic the closer the viewer gets to the Colorado River.

Future management and use of these lands must complement and ensure their visual integrity in order to protect the integrity of the entire Grand Canyon physiographic province.

The prehistory of lands encompassed by the study areas is not well-known. Given the limited amount of information available, it seems best to begin discussing prehistory in the larger context of the Arizona Strip region.

Southwestern prehistory can be divided into three large periods: Terminal Pleistocene (Paleo-Indian), Archaic, and Post-Archaic (Ceramic). The first of these periods dates to 11,000 years ago, and perhaps earlier. The Post-Archaic is often marked by the use of ceramics, the introduction of which can be thought of as having taken place about the time of Christ.

Inhabitants of the Southwest at the end of the Pleistocene Epoch are thought to have lived as nomadic hunters, although this is an oversimplification. No late Pleistocene sites have been found in the Arizona Strip or anywhere nearby. Following the Pleistocene, groups of hunting-and-gathering people occupied the Southwest and Desert West, leaving remains that have puzzled archeologists for years. A Western-based Archaic tradition as dominant in the Arizona Strip from after the Pleistocene (c. 8500 B.C.) until about the time of Christ appears most probable.

Beginning about the time of Christ, the Arizona Strip was occupied by Puebloan people. Their presence in the area ended about A.D. 1150. The pueblo sites found within the study area fall into the Anasazi tradition. This tradition, centered in the Four Corners region of the Southwest, is considered to have branches at its periphery. Two of these branches, or subcultures, are the Virgin and Kayenta. The Virgin branch has its center in the Arizona Strip and contiguous parts of Nevada and Utah. The Kayenta branch is located to the east in northern Arizona and southern Utah. These branches are more like each other than not and, for convenience, are combined under the term Virgin-Kayenta.

After abandonment in 1130 A.D. or so, the Arizona Strip was occupied by the Southern Paiute, a hunting-gathering population which later adopted agriculture. The Southern Paiute may have been contemporaries of the Puebloan people in the Arizona Strip or may even have had the Virgin people as ancestors. In any case, the Paiute were living in the Arizona Strip at the time of the first European exploration.

An archeological survey was undertaken in 1977 to provide a partial inventory and assessment of cultural resources in the study area itself. Exactly how many archeological sites are within the Adjacent Lands survey area is difficult to judge; past surveys, for the most part, have been casual and sporadic. This survey accomplished a detailed survey of less than one percent of the study area's 730 square miles. Additional coverage of about five percent of the area was provided by helicopter inspection. Two hundred and twelve small transects, placed at statistical random, were inspected. At 171 transects, indications of past human occupation were found, including historic and prehistoric sites and isolated artifacts. Seven historic mines and ranches were recorded as well as four prehistoric sites with aboveground masonry walls. Many of these sites are primarily lithic scatters, interpreted as historic rock quarries, chipping stations, and camping sites. Cliff granaries, ceramic sherd scatters, and rock art were also found. While no

precise estimate of site density was made, an argument could be made that a total inventory of the study area would reveal sites numbering in the thousands. Evidence was found for the presence of hunter-gatherers of the Archaic tradition who entered the study area about 4,500 years ago. The occupation sequence after this time is difficult to reconstruct with any precision, as only 58 identifiable prehistoric components were found in the study area. The remainder of sites did not have the appropriate artifacts or architecture to allow assignment to time or cultural groups.

Nonetheless, from evidence in hand it is apparent that, immediately following the Archaic period, semi-sedentary agriculturalists of the Virgin-Kayenta tradition occupied the study area in small numbers. Only three Basketmaker/ Pueblo I sites were identified, all in the Shivwits area. The bulk of culturally identifiable sites dates from the subsequent Pueblo II period. These sites were found distributed in equal measure in both Shivwits and Kanab survey areas. The last Puebloan occupation, which ended with abandonment of the study area in about A.D. 1150, was restricted to the Shivwits area. All six of the Pueblo III sites were found there.

Four sites on the Shivwits Plateau contained Paiute pottery. Dates for these sites are unknown, but it is probable that they are later than A.D. 1100, and may be even more recent.

Some implications may be drawn from these observations. It is probable that Puebloan population expansion, or other pressures, became sufficient at around A.D. 500 to allow the temporary occupation and use of the study area's western sector, an area which was dry and inhospitable at best. At about A.D. 900-1000 the eastern sector was opened to human use. Several centuries later, the Kanab area was abandoned by the Virgin-Kayenta, and by A.D. 1150, so was the entire study area. The study area was always marginal to the requirements of the Puebloans, with the Kanab area offering even fewer amenities than the Shivwits area. The Southern Paiute way of life was easily adapted to conditions in the study area, and the Paiute were able to occupy the niche left by the Puebloans.

Something can be said about location of sites relative to landforms. There were no great differences in distribution or site type between esplanade and drainage locales, since drainages are either cut into the esplanade itself, or are at about the same elevation and in similar environmental zones. There were, however, marked differences in site distribution between the esplanade/ drainages (lowlands) and the plateaus (uplands). While transections were placed in about equal number in both upland and lowland areas, sites of all kinds are located predominantly in the uplands. Seventy-three percent of the Kanab sites are in the upland plateaus and about 95 percent of the Shivwits sites are upland. The percentage difference is not quite so striking when comparing locations of isolated artifacts. There are about half as many of these locations in the lowlands as in the uplands. It was also found that proximity to reliable water sources was not an important location factor. Two-thirds of sites in the study area are more than 2.5 miles from dependable sources of water; only 15 percent are within one mile of good water. This lack in correlation of reliable water source with site location carries over through periods, a time when agriculture (and by implication the use and control of water) was important. Yet only four of these 33 sites are within a reasonable tranport distance of water.

It is most probable that the plateaus were given over to more extensive occupation while lowland areas were visited only sporadically and in the interest of limited natural resource use. Of the 309 larger prehistoric campsites and base camps, only one is located in the lowlands. Conversely, of the eight small, temporary campsites, six are located in the lowlands.

It also seems that agriculture was of very little importance in the study area. Occupation was most likely seasonal and directed toward hunting, plant gathering, stone quarrying, and tool manufacture. It is suggested that sites in the study area reflect a small segment of the seasonal round of procurement activities of people who made their permanent homes elsewhere in the Arizona Strip. To strengthen this hypothesis, no permanent habitation sites have been found within the study area.

EVALUATION

The Archeological Reconnaissance of Lands Adjacent to the Grand Canyon states:

> "An important factor in assessing the significance of this particular set of resources is the role they might play in furthering the integrity and completeness of Grand Canyon's cultural resources as a whole. The full range of cultural resources in the park has not yet been documented. For reasons of interest only to the historian of archeology, systematic surveys within the park boundaries have concentrated on locating masonry structures and ceramic artifacts. The picture as it is painted at present is quite different from that of the study area. The impression given by a past research is one of many closely spaced structures and small villages of long-term occupancy, complete with ceremonial features and terraced gardens. This is in contrast to the resources of the study area which consist of a few structures and many small, temporary camps and flint processing stations. As different as these resources may be, they are all part of the Grand Canyon story and are of equal importance in interpreting and explaining the events of the past. The significance of the study area's cultural resources lies mainly in their capacity to provide this historical, scientific, and interpretive information. Having this potential, intact sites within the study area are eligible for nomination to the National Register of Historic Places. It is not possible, given the incomplete coverage of the study area, to determine the eligibility of all possible individual sites within it. The survey has provided adequate information, however, to establish that, as an aggregate, the sites meet the standards established by the Advisory Council on Historic Preservation."

LAND USE OF THE STUDY AREA

GRAZING

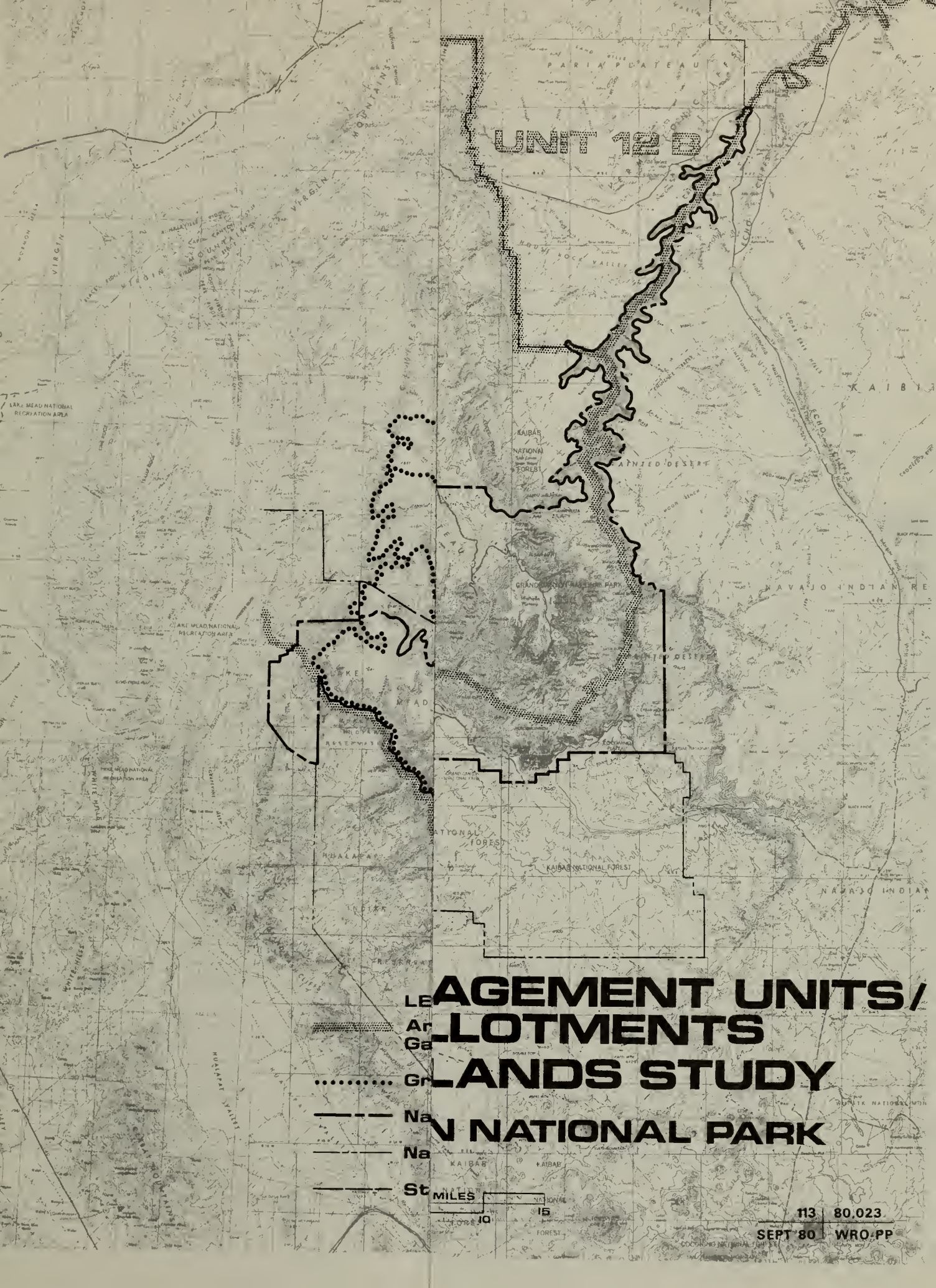
Grazing rights to lands in the study area are administered on a permit basis by the Bureau of Land Management on public lands and in Lake Mead NRA, and by the U.S. Forest Service in Kaibab National Forest. The Bureau of Land Management administers grazing on Lake Mead NRA in accordance with a 1972 Memorandum of Understanding with the National Park Service. Grazing allotments generally consist of public lands but may include parcels of private- or State-owned lands. The number of livestock and season of use are stipulated for each allotment.

The livestock operations (ranches) and allotments in the area involve a complex set of relationships. An individual livestock operation may occupy a single allotment, share parts of one or more allotments with other livestock operations, or occupy more than one allotment. The allotment itself may be enclosed within a single boundary or may consist of separated areas or pastures. The livestock operation may be run by an individual, a family, a corporation, or organization such as a church.

Availability of water throughout the year is the major factor limiting uniform grazing and movement of cattle in the Strip country. The most critical time is during the spring dry season when there is a shortage of adequate forage. Forage production is biggest during summer, but production remains variable because of the spottiness of thunderstorms. To compensate for variable rainfall, some operators have allotments scattered throughout the area. If the allotments are widely separated, operators truck their cattle between allotments. Through the years this pattern has enabled operators to "follow the green" when a storm hits one area and not another. Other operators "follow the green" within an individual allotment if a storm hits one part of the allotment and not another. The pinyon-juniper vegetation association on the upper plateaus has been extensively "chained off" in order to encourage growth of more desirable cattle forage but success has been varied due to a lack of follow-up range management practices such as reseeding and rotation of livestock to allow vegetative recovery.

The Bureau of Land Management (BLM) administers 25 grazing allotments associated with the study areas. One half of these allotments are entirely within the study area, the remainder have between 5 and 80 percent of their land area affected. Presently, 2,000 head of cattle from these allotments graze these lands, a total of 17,500 animal unit months throughout the year. One allotment which is 70 percent within the study area in Whitmore Canyon allows sheep to graze six months of the year as well. All other allotments are for cattle only. The U.S. Forest Service administers three allotments associated with the Kanab Canyon study area in Kaibab National Forest, allowing 350 cattle 1,100 animal unit months of grazing time in the winter months.

The present quality of the range in the study areas for grazing purposes varies from 15 to 20 acres per animal unit month (AUM) in the BLM-administered allotments. This means that between 15 and 20 acres of land are necessary to support one head of cattle for one month. Range carrying capacity on the



AGEMENT UNITS/
LOTMENTS
LANDS STUDY
N NATIONAL PARK

LE
Ar
Ga
Gr
Na
Na
St

113 | 80,023
SEPT 80 | WRO-PP

UNIT 13

UNIT 12 A

UNIT 12 B

LEGEND

Arizona Department of Game and Fish Game Management Unit

..... Grazing Allotments

——— National Park

——— National Forest

——— Study Areas

FIGURE 7

GAME MANAGEMENT UNITS/ GRAZING ALLOTMENTS ADJACENT LANDS STUDY

GRAND CANYON NATIONAL PARK

NORTH

MILES 0 5 10 15

113 | 80.023

SEPT 80 | WRO.PP

Kaibab National Forest drops to approximately 25 acres per AUM due to the short period of use allowable (three winter months), the productivity of the range, and the rough terrain. Taken as a unit, Kanab Creek is not suited to being grazed on a sustained yield basis if sound management principles are followed. Soil resource inventories show 4,000 acres with moderate to high revegetation potential.

The Bureau of Land Management estimates that the current value of ranches in the area is $1,100 per animal unit. This means that the 2,350 cattle presently allowed to graze the study areas are worth $2,585,000 to the respective cattle operations.

EVALUATION

The lands of the study area are an important part of the history of human occupation in the Arizona Strip and grazing plays a predominant part of that history.

Although a relatively small number of cattle graze these lands in comparison with the total livestock population of the Arizona Strip, they do provide critical range for a number of cattle operations. More than half of the allotments are designated for year-round grazing; however, the study areas are most valuable to the permittees as winter rangeland for the affected cattle operations.

Past unrestricted grazing on a year-round basis has resulted in severe overgrazing of available rangeland. The majority of the range in the study area is presently in fair or poor condition. The riparian canyon bottoms have been especially degraded by overgrazing.

The creation of allotments by the U.S. Grazing Service in the 1930's was the first of a series of management practices on public domain lands that gradually helped improve much of the range. Other practices followed with mixed results, including the development of catchment basins (tanks), manipulating vegetation by chemical means, seasonal use or rest/rotations, and culminating with chaining stands of pinyon/juniper.

In the future, a general trend toward reducing grazing pressures further on these lands to encourage vegetative recovery seems evident. The Bureau of Land Management is presently implementing livestock grazing management programs for lands under its jurisdiction. These plans propose to reduce the number of livestock grazing in the area and to rotate grazing use in a manner favorable to range improvement. These plans also allocate forage for wildlife in addition to changing fences around waterholes for better wildlife access.

For the BLM planning process, the Arizona Strip has been divided into the Vermillion Resource Area east of the Hurricane Cliffs and the Shivwits Resource Area west of the Hurricane Cliffs. In the recently completed Vermillion Grazing Management Plan, the Bureau of Land Management proposes to reduce grazing by 18% within that area from a total of 108,736 AUM's to 89,535 AUM's. Wildlife is to be allocated an additional 11,940 AUM's. The Shivwits Grazing Management Program proposes to reduce grazing in its area by 24% from a total of 83,940 AUM's to 64,305 AUM's. Wildlife would be allocated 15,590 AUM's.

The Kanab Creek study area within Kanab National Forest has also had reduction imposed in animal unit months and cattle allowed by the U.S. Forest Service. The 19,000-acre Kanab Creek allotment has been in a "non-use" status for the past three years in an effort to restore range conditions and vegetative cover impacted by past grazing practices. When restoration is completed, an initial allotment of forty cattle for three winter months (20 AUM's) will be set. This indicates an AUM/acre ratio of 158 total acres per animal unit month, or a net of five acres per animal unit month when based upon the 1,000 acres suited for grazing.

The National Park Service does not allow grazing as a matter of practice within natural areas in the system. Grand Canyon National Park falls into this category. Lake Mead National Recreation Area allows grazing within its boundaries under authority of the Secretary of Interior in accordance with Public Law 88-636 of October 8, 1964. The law states:

> "The Secretary may provide for the following activities subject to such limitations, conditions or regulations as he may prescribe, and to such extent as will not be inconsistent with either the recreational use or the primary use of that portion of the area heretofore withdrawn for reclamation purposes:
>
> "1. General recreation use . . .
>
> "2. Grazing
>
> "3. Mineral leasing"

There are several problems inherent in the study areas which limit their capacity for grazing and make proper livestock allocation difficult.

1. Lack of dependable water sources can create unequal grazing pressures across allotments. Heavy to severe use occurs in watered areas whereas no use occurs in the areas where water sources are dry. There is available forage in some areas that could be utilized with the development of dependable water.

2. Wide ranges in annual precipitation cause wide fluctuations in forage production which hinders the proper planning of stocking rates for individual allotments.

3. Because of past grazing trespass and minimal administration, some areas (such as Kanab Canyon) have been overgrazed and shifts in the vegetative communities are evident. Soil compaction and subsequent erosion in these areas are also serious problems. These conditions must be recognized and remedies considered to restore and maintain the vegetative integrity and soil stability of these areas.

Presently, grazing must be considered a traditionally acceptable use of much of the study areas. However, many environmental problems here can be linked to grazing practices which have resulted in overgrazing and environmental degradation. In the past, this was basically a result of lack of recognition on the part of Federal land managers and cattle operators of range limitations and the fragile nature of the biological habitats inherent in arid regions.

In the future, continued grazing of these lands must recognize these limitations through the reduction in overall grazing pressures and the implantation of more stringent grazing management principles on the allotments in the study areas. Furthermore, grazing should be eliminated entirely in areas of critical natural resource habitats such as the riparian plant communities which are most valuable as wildlife habitat.

RECREATION

The study areas are part of a major open space recreational resource which includes outstanding sightseeing, natural resources in a primitive state, and geological and archeological-historical values. The study area lands are located near numerous recreational lands of national interest including Grand Canyon National Park and Glen Canyon and Lake Mead National Recreation Areas. In contrast to these areas which attract large numbers of visitors engaged in localized and intensively managed recreation, the study area attracts relatively small numbers of visitors engaged in dispersed and relatively unregulated activities.

More than 80 percent of recreational visitation to the area involves deer and predator hunting, sightseeing and backpacking. The remaining visitor use involves activities such as hiking, nature study, photography, primitive camping, and rock collecting.

Hunting

Hunting is a traditional use dating back to man's first habitation of this area, and as previously stated, big game hunting for mule deer draws a substantial part of the visitation to the study area. The turkey population on Mt. Dellenbaugh is not large enough to warrant hunting at present, and small game such as dove and rabbit are not actively sought by hunters.

The previously mentioned Units 12A and 13 deer hunting success ratio of 20% is consistently higher than for any other areas in the State of Arizona. The following table is a breakdown of statistics for each of the two units.

TABLE 3

	Unit 12A	Unit 13
Herd Size	5,000 (± 1,000)	3,000 (± 1,000)
Number of Permits	1,800	1,800
Number of Hunter Days	5,935	7,371
Deer Harvested	410	303

There is direct competition with livestock for available forage on both summer and winter ranges. However, most biologists no longer consider summer habitat

to be as critical as winter habitat either from the standpoint of forage availability, cover, or water distribution. Winter forage and green forbs in early spring are more limiting.

The resident deer herd has usually begun its migration out of the higher elevation summer ranges by the time hunting season commences. Therefore, at that time of the year, deer can be found not only on the lower plateaus and rim lands but within the canyons themselves where, from a logistics standpoint, hunting can be extremely difficult. However, winter weather conditions must be particularly severe in order to force large concentrations of deer out of the more heavily vegetated uplands and into the relatively barren canyons.

The Arizona Game and Fish Department estimates that if Andrus, Parashant, Whitmore and Kanab Canyons proper were closed to hunting, a one-third reduction in the average number of hunting permits for Unit 13 would be necessary. This could result in a reduction of between 600 and 1,200 hunting permits for Unit 13 depending on the total number issued for this unit in a particular year.

However, this permit reduction would include permits allocated to the lands in Lake Mead National Recreation Area which were transferred to Grand Canyon National Park as a result of the Grand Canyon Enlargement Act of 1975. Hunting permits were not reduced after passage of this Act which closed over 375,000 acres of Unit 13 to hunting. In addition, the permit system does not reflect the actual number of hunters that venture just into the study areas. These areas are at least accessible portions of Unit 13 open to hunting.

EVALUATION

Although the study area experiences a relatively small visitation for recreational purposes, this visitation constitutes an important use of the area and must be considered among the highest and best use of these lands. This is true of all of the canyons and viewing platforms in the study area.

Recreational hunting in the study areas, particularly in the canyon and rimlands, is a unique, high-quality experience for a select group of hunters because of the wild and primitive nature of the natural environment. A relatively small number of hunters are willing to undergo the hardships inherent in hunting here such as rugged canyon terrain and limited access. However, this insures minimum contact with other hunters and a true wilderness experience. These circumstances coupled with the potential for a trophy-sized animal have given this area a high reputation among the hunting fraternity.

There is a basic philosophical difference between the National Park Service wildlife management policy which preserves wildlife as a component of natural ecosystems and the policies of the Bureau of Land Management and the Forest Service for managing wildlife habitat to favor wildlife production. The Bureau of Land Management and the Forest Service game management programs include such activities as chaining and revegetation, prescribed burning, and water tank development to increase wildlife populations. These populations are ultimately managed by the Arizona Game and Fish Department.

Grand Canyon National Park is classified as a natural area and hunting is not allowed within its boundaries in keeping with its preservation mandate. All

of the lands of the study area including those of Lake Mead National Recreation Area are open to hunting at the present time. Although Lake Mead National Recreation Area is administered by the National Park Service, it is classified as a recreational area. The Act of October 8, 1964 (Public Law 88-839), which provided for "an adequate basis for administration of Lake Mead National Recreation Area," recognized hunting as a traditional use of the area and states:

> "The Secretary of the Interior shall permit hunting, fishing and trapping on the lands and waters under his jurisdiction (in Lake Mead N.R.A.) in accordance with the applicable laws and regulations of the United States and the respective States."

Basically, hunting in these lands offers a classic wilderness hunting experience of a type that, with the exception of Alaska, is quickly disappearing from much of the United States. This is mainly a result of increased hunting pressures on a shrinking natural habitat base. In order to maintain the wilderness qualities of this experience, the permit system will have to restrict hunting in the study areas to a relatively small number of applicants. As previously stated, the most notable characteristic common to all the study areas is a spaciousness and a feeling of isolation. If hunting is to be allowed in the future, it must be strictly regulated regarding number of permits issued to insure that the unique wilderness quality of that experience is not compromised.

ENERGY DEVELOPMENT

Oil and Gas Resources

The deep gorge of the Colorado River and its tributary canyons, coupled with metamorphis at a depth of 6,000 feet, precludes accumulation of oil and gas in areas adjacent to the canyon, including the study area. However, the generally northeastward dip of the Paleozoic rock strata beneath the upland Shiwits and Uinkaret plateaus to the north would retain any oil and gas accumulation. The thick sedimentary rocks there are believed to contain suitable source and reservoir beds for oil and gas accumulation. This condition, however, occurs over 50 miles north of the study areas near the Arizona-Utah border.

Four exploratory wells 3,700-4,700 feet deep have been drilled in northern Mohave County outside the study areas. Although light oil staining in various formations was in evidence, none of these wells were commercial producers and all are plugged and abandoned.

Some interest in further testing the area has recently been expressed by attempted leasing of lands in T33N, R15W west of the Grand Wash Cliffs in Lake Mead National Recreation Area. At present, two oil and gas leases are active, three have been relinquished and two are pending in this area. No production has occurred from any of these leases.

Geothermal Resources

A number of minor warm springs occurs along the lower reach of the Colorado River in Grand Canyon, but there is no other indication of geothermal

potential lying beneath the volcanic flows of the Shivwits and Uinkaret Plateaus. The Kanab Plateau and Kanab Canyon study areas, formed entirely of sedimentary deposits, have no geothermal resource potential.

Mineral Resources

Metallic mineral resources within the Grand Canyon region include silver, gold, lead, copper, and uranium. Prospecting for gold, silver, copper, and lead began in the 1850's. During the height of this prospecting era, 85 to 100 claims were located in what was later to become Grand Canyon National Park and Lake Mead National Recreation Area. However, by 1895, most of the mining ventures in the area had failed. The low quality of the ore and limited extent, coupled with a lack of water and difficulty of transportation, prevented any significant amount of production.

In many places, uranium-bearing minerals were associated with the ore of these early prospecting ventures, but were not recognized until the 1940's or later. Uranium is the only energy resource commodity that has been produced in the Grand Canyon region and there appears to be some potential for additional production. All of the known, economically usable deposits of uranium in the area occur in collapse-breccia pipes which average 300 feet deep and 300 feet across. Figure 8 shows the known locations of these pipes in the central and western Grand Canyon region, including the study areas. Although most of the known pipes are barren of economic mineralization, some have deposits of valuable ore bodies. Five of the nine known breccia pipes in the United States which have produced uranium ore are located in the Grand Canyon region, and a number of pipes here have been mined for their copper, silver, and gold content.

Three pipes within the study area that have produced ore in the past are the Hack Canyon Mine in the Hack Canyon tributary of Kanab Canyon, the Copper Mountain Mine located between Parashant and Andrus Canyon, and the Copper House Mine in Andrus Canyon.

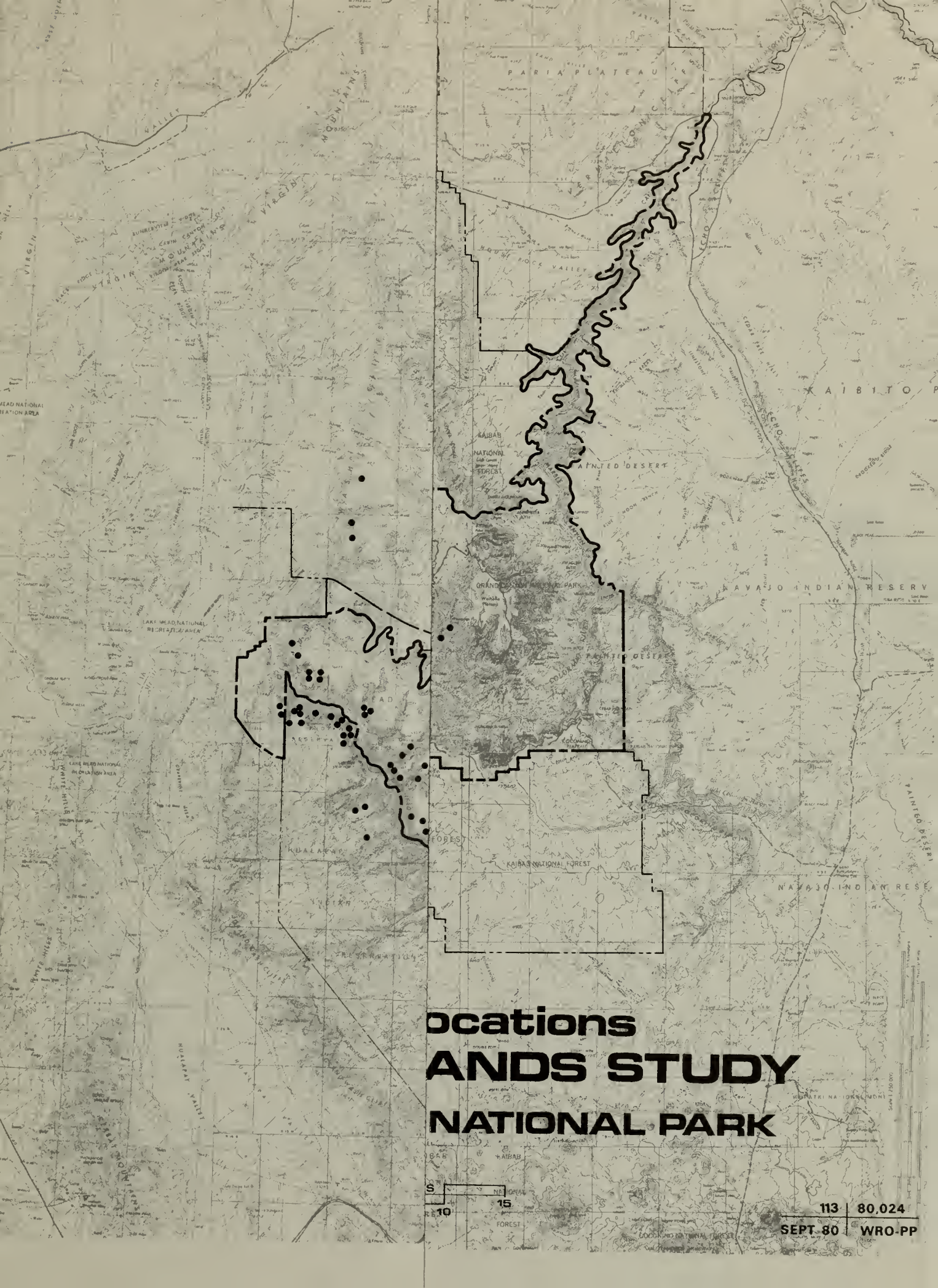
The Hack Canyon Mine has produced small amounts of copper ore since 1920. Uranium minerals were discovered while the mine was being worked for copper during late World War II. The Copper Mountain Mine has been in existence since 1875. Although copper has been the principal ore produced, some lead, zinc, silver, and gold were also produced. Recent examinations of the property indicate that ore grade uranium minerals are present. The Copper House Mine has produced only copper to date.

EVALUATION

It is believed that the only potential for mineral extraction in the study area lies in those uranium-copper-vanadium deposits which may be present in these large collapse-breccia pipes. Many known pipes have not been explored. Mineral potential may exist in pipes at levels where hydrologic actions relating to the formation of the esplanade could have concentrated metals even though there are few signs of mineralization at the surface.

RESOURCE/LAND USE SUMMARY

Considering the vast acreages involved, the remoteness of the study area and the nature of the Congressional request, this reconnaissance study focused on



ocations
ANDS STUDY
NATIONAL PARK

113	80,024
SEPT 80	WRO-PP

Breccia Pipe

National Park

National Forest

Study Areas

FIGURE 8

GEOLOGY / Breccia Pipe Locations ADJACENT LANDS STUDY

GRAND CANYON NATIONAL PARK

NORTH

MILES 0 5 10 15

113 | 80,024

SEPT. 80 | WRO-PP

the broad land use and environmental characteristics of the area surveyed. In general, the environmental values present vary in significance across geographical provinces within the study area. The same may be said of land use practices. More specifically, the degree of significance of these natural resources or land uses is dependent upon climatic conditions and geologic features throughout the study area. In turn these climatic conditions and geologic features are a reflection of changes in elevation and of the erosional characteristics of the Grand Canyon region.

Upland Plateaus - The uplands of the Shivwits Plateau are most significant for their historic/archeological and biological resource values and low in geologic and scenic value. This is a reflection of their low topographic relief, relative accessibility, and their higher rainfall with resulting vegetative cover for wildlife habitat. Conversely, these attributes make the Shivwits Plateau highly suitable for grazing, hunting and general recreation such as primitive camping. Mineral resources are not a significant factor on the upland plateaus.

Rimlands/Upper Cliffs - The rimlands and upper cliff formations are present in all of the study areas and define the upper rim of the Grand Canyon. This area has high geologic and scenic resource value attributable to the dramatic, rocky topographic relief and numerous vistas of the Grand Canyon proper. However, its starkness and difficult terrain limit its biological habitation to a few species such as bighorn sheep and migrating mule deer and reveal little of historical or archeological significance. In the land use category, this geographic region is highly suitable for general recreation, particularly hunting, sightseeing, and hiking.

Upper/Tributary Canyons - The tributary drainages to Kanab Canyon and the upper reaches of Andrus/Parashant/Whitmore Canyons within the study area contain sufficient riparian habitat to deem them valuable as biological communities. They also reveal a significant number of archeological and historic remnants of past human occupation. These canyons are not particularly interesting from a scenic point of view. Their relative accessibility provides recreational opportunities for hiking, hunting (the wintering deer herds can be found in many of these side drainages), and mineral exploitation. Although grazing is practiced here, it is not compatible in limited areas of riparian plant communities that are necessary for wildlife survival.

Esplanade - As viewed from the upland plateaus, the flat terraces of the esplanade in Kanab and Andrus/Parashant/Whitmore Canyons lend a high degree of geologic and scenic diversity to the vertical environment of Grand Canyon. This feature is sparsely vegetated by desert shrub and therefore not particularly valuable as wildlife habitat and was little frequented by aboriginal inhabitants. The eroded surfaces of the esplanade have exposed numerous collapsed-breccia pipes, therefore the potential for metallic ore extraction exists although little exploration has been done.

Grazing has been eliminated from the esplanade in Kanab Canyon; however, five separate grazing allotments depend upon portions of the esplanade in Andrus/Parashant/Whitmore Canyon for winter range for their cattle. Hunting for mule

deer is a significant activity in this portion of the study area, but this is more a factor of the wilderness quality of the hunting experience rather than the quantity of animals present.

Inner Canyons - The inner canyons of Kanab and Andrus/Parashant Canyons that eroded below the level of the esplanade are extremely rugged and continually shifting in their composition due to seasonal flash flooding. Their interesting physiography lends a high degree of geologic and scenic interest to this landscape province. Where riparian plant communities exist, high biological significance is attached to this wildlife habitat. Relatively little of archeological interest has been observed in these inaccessible areas. The high degree of continuing erosion in these lower canyons reveals a significant number of collapsed-breccia pipes (especially in Andrus/Parashant/ Canyons) which provide potential for metallic ore extraction.

Conclusion

No one geographic area or province within the study area is more significant than another in terms of natural and cultural resources values; and all areas are suitable to varying degrees for "nonpark" land uses of one type or another.

What is apparent is the integrated nature of the study area lands with their immediate surroundings on the Arizona Strip, with each other, and with the entire Grand Canyon geographic province, and the entire Colorado River watershed that constitutes the drainage system for the Colorado Plateau.

The most significant environmental value of these lands relates to their outstanding geological resources which deem their scenic values to be most important to the visitor. As a consequence, recreational use of the land (including sport hunting) is the most complementary land use of the general study area.

In addition, cattle ranching is intrinsically linked to the life styles of the people of this region and must be recognized as a historic and legitimate land use practice in the study area. This is a use which could become more viable in the future through the implementation of more comprehensive and environmentally sound grazing practices.

General Discussion

I. Section 2 of the Grand Canyon Enlargement Act of 1975, the Declaration of Policy reads as follows:

> "It is the object of this Act to provide for the recognition by Congress that the entire Grand Canyon, from the mouth of Paria River to the Grand Wash Cliffs, including tributary side canyons and surrounding plateaus, is a natural feature of national and international significance. Congress therefore recognizes the need for, and in this Act provides for the further protection and interpretation of the Grand Canyon in accordance with its true significance."

The entire Grand Canyon of the Colorado River can be defined as that system of canyons eroded below the Kaibab/Toroweap limestone geological formation which exists as a continuous surface over all of the plateau lands of northwestern Arizona. This sedimentary layer forms the major upper rim of the Grand Canyon.

Within this system of canyons lies the present Grand Canyon National Park encompassing and protecting outstanding natural and cultural features representative of this erosional phenomenon. The entire Grand Canyon complex together with its "tributary side canyons and surrounding plateaus" encompasses a vast land area in addition to the existing park. It includes major tributary drainage systems such as the Little Colorado River, Havasu Creek, and Kanab Creek Canyons. Included are portions of three Indian reservations, Kaibab National Forest, BLM-administered public lands, and State and privately owned lands, all in that land area recognized by Congress as having national and international significance. The total land base involved is possibly double that of the existing park.

This recognition by Congress of the great significance of the Grand Canyon did not imply that the Canyon in its entirety - "from the mouth of the Paria River to the Grand Wash Cliffs including tributary side canyons and surrounding plateaus" - was to be included within Grand Canyon National Park. What the Congress intended, along with giving recognition to the entire Grand Canyon phenomenon, was to further protect additional significant features closely associated with the existing National Park and to consolidate their management by placing them within an enlarged park. Congress also suggested that there were other associated areas of possible merit for park purposes that should be studied and reported upon to some future Congress.

The land areas designated for study in the Conference Report are all within the Grand Canyon as defined by Congress and designated as a natural feature of national and international significance. However, should these lands, which are similar in character to other Grand Canyon lands both within and outside the existing park, be included within Grand Canyon National Park?

In view of these circumstances, and as stated earlier in this report, the scope of this study has been expanded beyond a simple determination of whether these lands qualify for national park designation, as requested by Congress.

Instead, their resource values were determined, the management needs of these resources were assessed, and appropriate land management techniques were suggested to satisfy these resource management needs.

MANAGEMENT CONSIDERATIONS

Wilderness Proposals

Congress passed the Wilderness Act of 1964 to establish a National Wilderness Preservation System and to provide for the study of Federal lands in the national forests, wildlife refuges and the national parks for inclusion in this system.

In conformity with the Wilderness Act, the U.S. Forest Service and the National Park Service have completed wilderness studies of the portions of the study area within their jurisdiction.

In 1979 the Secretary of Agriculture, as part of that Department's Roadless Area Review and Evaluation, nominated 64,162 acres of the Kanab Canyon area within Kaibab National Forest to Congress for wilderness designation. Almost all of this acreage is within the 70,000-acre portion of the study area under Forest Service jurisdiction (Figure 9).

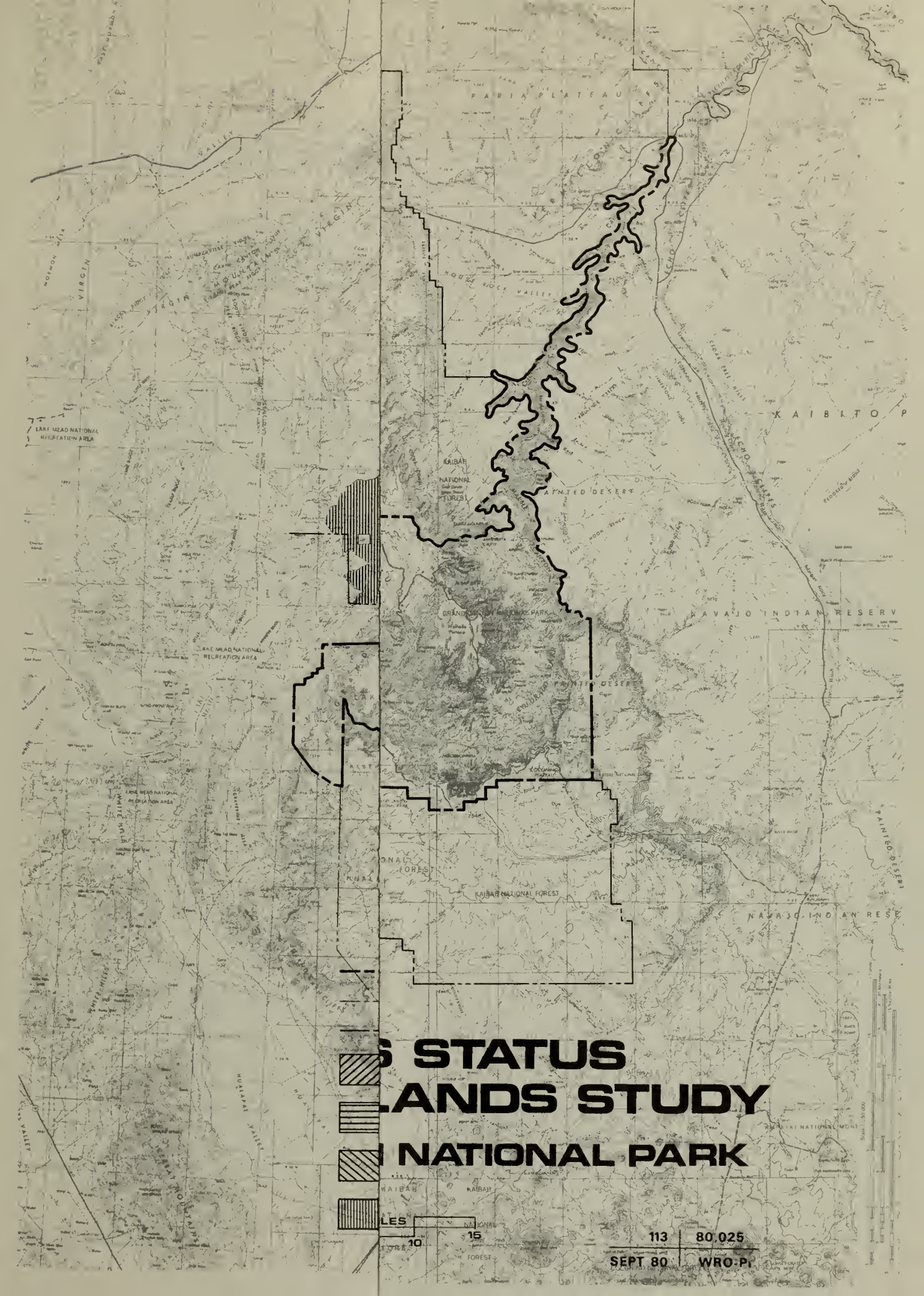
The National Park Service has nominated to Congress 57,215 acres for wilderness designation within Andrus/Parashant/ Whitmore Canyons in Lake Mead National Recreation Area. In addition, 83,980 acres of the Shivwits Plateau portion of Lake Mead have been designated as a potential wilderness addition.

These lands will be eligible for wilderness designation after the National Park Service completes the purchase of the outstanding mineral reservations and cancellation of repurchase rights held on these lands by Santa Fe Industries. These lands are all within the portion of the study area administered by the National Park Service.

The Bureau of Land Management (BLM) was brought into the wilderness study program as a result of the new Organic Act, the Federal Land Policy and Management Act (FLPMA) of 1976. The Bureau of Land Management is required by this act to review the lands it administers for wilderness potential and nominate qualifying lands to Congress within 15 years of passage of the FLPMA of 1976. Figure 9 illustrates those portions of the study area under BLM jurisdiction that have wilderness values and are designated as Wilderness Study Areas as part of their Arizona Wilderness Review. During the wilderness study process, these lands will be managed in a manner so as not to impair their suitability for preservation as wilderness.

Grazing Management

The Bureau of Land Management's proposed grazing management plans for public lands on the Arizona Strip (including Lake Mead National Recreation Area) were discussed earlier in this report. In total, these plans represent a 22% reduction in the number of animal unit months of grazing allocated to the Arizona Strip from 192,676 existing to 153,840 proposed. The plans also advocate reservation of an additional 27,530 AUM's or 18% for wildlife production on the Arizona Strip.



STATUS
LANDS STUDY
NATIONAL PARK

National Park

National Forest

Study Area

United States Forest Service Rare II Wilderness Proposal 1979

National Park Service Lake Mead Wilderness Proposal 1979

Potential Wilderness

Bureau of Land Management Wilderness Review Wilderness Study Areas (Nov. 15, 1980)

FIGURE 9

WILDERNESS STATUS ADJACENT LANDS STUDY

GRAND CANYON NATIONAL PARK

NORTH

MILES 0 5 10 15

113 | 80,025

SEPT 80 | WRO-Pr

Although the study areas represent only a portion of the Arizona Strip lands, this pattern of reducing grazing pressures for the benefit of range restoration and wildlife production remains the same on the lands discussed in this report.

In addition, grazing presently is not allowed on the Kanab Creek allotment in Kaibab National Forest. The U.S. Forest Service considers restoration of the riparian habitat in this portion of the study area to be of prime importance. This policy is reflected in the non-use grazing restrictions attached to these lands.

Public Opinion

The public workshops held on the Task Directive for this study revealed a high degree of public opposition to any change in land management practices which would eliminate grazing or sport hunting as land uses in the study area. However, there was a general consensus that the resources these lands possess need to be protected and managed for the good of everyone. Basically, workshop participants wished to see the land remain wild and undeveloped and that land management practices should reflect this concept.

The extensive written comments received also reflected these concepts as well as expressing support for "multiple use" management of the study area lands. However, there was almost total agreement that uses must be of a non-consumptive nature.

Threats to the Resources

The only major threat to this integrity of the resources of the study area is through activities associated with exploration and extraction of minerals and associated mining activities in the Grand Canyon region.

Possible discovery and extraction of uranium-copper-vanadium deposits in collapse-breccia pipes in the study area would cause significant environmental impacts, and mining activities would seriously degrade the natural wilderness character of the surrounding environment. There are concentrations of these breccia pipes in Parashant Canyon associated with the Copper Mountain Mine, where ore grade uranium minerals are present.

The possibility of future exploration and discovery of mineral resources in the study area is highly speculative and uncertain at this time. A related threat to the integrity of the entire Grand Canyon region, including the study area, rests with the proposed strip mining and gasification of coal for energy production in southern Utah to the north. This activity could further degrade the air quality of the region that is so important to the visual integrity and scenic grandeur of the Grand Canyon.

Grand Canyon National Park has been classified as a Class I area as a result of ammendments in 1977 to the Clean Air Act (P.L. 88-206). The Act declares that the protection of visibility over national parks and wilderness is a national goal. However, the Class I designation does not eliminate the threat of additional air polution in the region from distant sources such as newly constructed power generation facilities.

Game Management

The Arizona Department of Game and Fish administers sport hunting regulations on the Arizona Strip through memorandum of agreement with the U.S. Forest Service, Bureau of Land Management, and National Park Service for Lake Mead National Recreation Area. The migration patterns of the Kaibab mule deer herds are such that similar federal management policies across the entire range, is desirable in order to properly monitor the herd, with the goal of setting seasons, estimating hunting permit levels, and generally maintaining a healthy herd.

MANAGEMENT OPTIONS

1. National park designation of portions of the study area lands

It has been established that the lands of the study area are part of the Grand Canyon geologic province that the U.S. Congress recognized as having national and international significance.

As a result of this study, it is evident that there are significant features associated with the study areas that are of national park caliber when compared with like features already included within Grand Canyon National Park. Geologic and scenic resources are the study areas' major resource assets and their most significant environmental values linking them to main Grand Canyon features. Consequently, the study area lands below the Upper Cliffs formations in Kanab, Andrus, Parashant and Whitmore Canyons, being geologically linked to the Grand Canyon, could logically be placed within Grand Canyon National Park.

However, there are also viable land use practices such as sport hunting and cattle grazing within the area which would be in conflict with the management practices of the National Park Service as applied to natural areas in the system. National park designation would preclude these uses on those lands so designated unless specifically allowed by the legislation that would be necessary to transfer these lands to Grand Canyon National Park.

These land uses are an integral and traditional part of the environmental framework of these lands. In fact, the historic settlement and use of these lands for ranching have enhanced their significance in terms of historic and cultural values. The elimination of these uses would diminish the value of these lands both economically and culturally.

Transferring study area lands to Grand Canyon National Park would eliminate any present or future threat to resource integrity through mining activities on the transferred lands. Mining is not permitted in natural areas of the National Park System such as Grand Canyon National Park.

However, activities associated with proposed coal strip mining and energy generation in southern Utah could still pose a threat to the air quality of the Grand Canyon region, regardless of the land-managing agency responsible for the study area.

2. Maintain the existing agency management responsibilities for the study area lands

There are advantages to maintaining the existing agency representation on these public lands.

As a result of this study, it is recognized that resource protection and comprehensive land use management practices are essential to insure the future environmental integrity of the study areas as well as all of the lands that border the internationally famous features of Grand Canyon National Park.

All three Federal agencies involved with managing the study area have the capabilities and legislative mandate to insure the future integrity of the resources under their jurisdiction. They also foster policies which allow for the continuation of land uses endemic to the study area that are compatible with long-term resource protection. Sport hunting and well-managed grazing by permit are examples of those uses.

This "multiple use" management concept is a cornerstone of the management policies of the U.S. Forest Service and the Bureau of Land Management. In addition, national recreation areas administered by the National Park Service such as Lake Mead National Recreation Area allow land uses such as hunting and grazing through their enabling legislation as long as such management is compatible with the protection of natural and cultural resources of the national recreation area.

Public opinion reflected in public workshops and within correspondence received was also united in support of maintaining the existing management structure of the study area. The overriding concern was for application of management practices which stressed preservation of natural and cultural resources to insure that the "wild" qualities of the area were not compromised and at the same time allowing continuation of nonconsumptive land uses, particularly hunting and grazing.

Improvements in range management and a reduction in grazing pressures by the U.S. Forest Service and the Bureau of Land Management in order to improve the quality of the vegetative communities of the study area have already been discussed. Sport hunting, if properly administered by the Arizona Department of Game and Fish, is a unique recreational asset to these lands and not a threat to resource integrity. A common, sustained yield approach for management of the deer herd that exists on the Arizona Strip enhances the successful management of the herd.

The only major threat to the resources of the study area in the future under present management responsibilities is through possible mining activities.

Wilderness designation of study area lands as presently proposed by the U.S. Forest Service (USFS) and National Park Service at Lake Mead National Recreation Area would partially mitigate that threat. The future nomination of Bureau of Land Management administrative lands, presently being

assessed in the study area for possible wilderness designation, will also partially mitigate the threat of mining activity on those lands so designated. In accordance with the Wilderness Act of 1964 (P.L. 88-577), existing mineral leases on USFS wilderness are to be managed under conditions prescribed by the Secretary of Agriculture which insure protection of the wilderness character of those lands. This includes requirements for restoration of lands disturbed by mining practices. Effective January 1, 1984, subject to existing valid mining rights, the minerals in lands within USFS wilderness are to be withdrawn from operation of mining laws by virtue of the provisions of Section 4(d)(3) of the Wilderness Act.

In accordance with the Federal Land Management Act of 1976, mineral leases on BLM wilderness study areas are to be managed so as to afford environmental protection to insure the continued suitability of such areas for preservation as wilderness. Once an area is designated BLM wilderness the provisions of the Wilderness Act of 1964 pertaining to management of mineral resources in national forest wilderness shall apply.

Within Lake Mead National Recreation Area, all lands with valid mineral leases and outstanding mineral rights attached have been excluded from the NPS wilderness proposal. However, wilderness designation will preclude the future exploitation of minerals on those lands within the NRA so designated. In addition, upon purchase of outstanding mineral rights on those lands designated as potential wilderness, they can be reevaluated and nominated for NPS wilderness. Hunting and grazing would still be allowed in the study areas regardless of wilderness designation.

As mentioned in the first management option, activities associated with coal strip mining and gasification for energy production in southern Utah would pose a threat to air quality of the region.

TENTATIVE CONCLUSIONS

It is the study team's conclusion that the option of transferring these lands to Grand Canyon National Park is not the sole means of insuring proper management and resource protection within the study areas. Appropriate management and protection of the study areas' significant resources can also be accomplished by maintaining the existing agency management responsibilities on the lands in question.

The study has shown that the nationally significant features within the respective agency's jurisdictions can be adequately protected through the application of a combination of comprehensive resource management techniques that are available to all three land-managing agencies.

This approach will also allow for the continued use of these lands for historic, compatible, nonconsumptive uses such as well-managed grazing and sport hunting.

Therefore, the study team recommends that the second management option, maintaining the existing agency management responsibilities for the study area lands, be followed.

In addition, wilderness designation of significant or fragile resources that meet the necessary criteria for wilderness should be a cornerstone of resource management and protection on these lands which adjoin and buffer Grand Canyon National Park. The study team strongly recommends that every effort be made through the wilderness study process to insure the wilderness nomination of all lands within the study areas that qualify.

REFERENCES

- Arizona, Department of Economic Planning and Development. Ownership and Administration of Public Lands in Arizona. State of Arizona. 1971

- Hoffmeister, Donald F. Mammals of Grand Canyon. University of Illinois Press. 1971

- Hughes, J. Donald. The Story of Man at the Grand Canyon. Grand Canyon Natural History Association. 1972

- Thompson, Richard A. Prehistoric Settlement in the Grand Canyon National Monument. 1970

- Various Authors, Geology of Grand Canyon. Museum of North Arizona & Grand Canyon National History Association. 1974

- U.S. Department of Agriculture, Forest Service. A Test of the Impact of Pinion-Juniper Changing on Archeological Sites by Evan I. De Bloois, Dee F. Green and Henery G. Wylie. Laboratory of Archeology. Ogden, Utah. 1974

- U.S.D.A. Forest Service; Land Resource Management Planning; Issues, Concerns & Opportunities. Southwest Region. 1980

- U.S.D.A. Forest Service. Proposed Kanab Canyon - Sandrocks Wilderness Study Area, Environmental Analysis Report. Kaibab National Forest. 1972

- U.S.D.A. Forest Service. Rare II - Roadless Area Review and Evaluation, Final Environmental Statement and Arizona State Supplement. Southwest Region. Albuquerque, N.M. 1979

- U.S.D.A. Soil Conservation Service. Cocopai Resource Conservation and Development Project, Program of Action. Phoenix, Arizona. 1973

- U.S. Department of Interior, Bureau of Land Management. Arizona Strip Wilderness, Draft Environmental Statement & Suitability Report Arizona. 1980

- U.S.D.I., B.L.M. Shivwitz, Proposed Grazing Management and Environmental Impact Statement. Arizona. 1979

- U.S.D.I., B.L.M. Vermillion, Proposed Grazing Management Plan and Draft Environmental Statement. Arizona. 1979

- U.S.D.I., B.L.M. Wilderness Review-Arizona. Initial Inventory of Public Lands Administered by Bureau of Land Management. April 1979

- U.S.D.I., Geological Survey. Status of Mineral Resource Information for Shivwits Plateau, Parashant, Andrus & Whitmore Canyons and Kanab Canyon Areas; Grand Canyon, Arizona by Eugene E. Foord, Edwin D. McKee and C. Gil Bowles. 1977

- U.S.D.I., National Park Service. Archeological Reconnaissance of Lands Adjacent to Grand Canyon. By George Teague & Carole McClellan. Western Archeological Center. Tucson, Arizona. 1978

- U.S.D.I., N.P.S. Management Options, Exxon Uranium Leases, Environmental Assessment. Lake Mead National Recreation Area, Arizona-Nevada. July 1977

- U.S.D.I., N.P.S. Master Plan and Environmental Impact Statement. Grand Canyon National Park - Arizona. August 1976

- U.S.D.I., N.P.S. Natural Resources Management Plan and Environmental Assessment. Grand Canyon National Park. September 1977

- U.S.D.I., N.P.S. Natural Resources Management Plan. Lake Mead National Recreation Area. Arizona-Nevada. June 1975

- U.S.D.I., N.P.S. Park Suitability Study, Grand Canyon National Park. February 1976

- U.S.D.I., N.P.S. Reconnaissance of the Shivwits Plateau by J. Maxon and R. Gale, Lake Mead National Recreation Area. July 1969

- U.S.D.I., N.P.S. Some Considerations for Assessment of Potential Additions to Grand Canyon National Park by William D. Lipe, Museum of No. Arizona and Richard Thompson, South Utah State College. Contract No. PX8100-50291. September 1976

- U.S.D.I., N.P.S. Statement for Management, Lake Mead National Recreation Area. Arizona-Nevada. 1977

- U.S.D.I., N.P.S. Preliminary Wilderness Proposal and Environmental Impact Statement, Lake Mead National Recreation Area. January 1979

- U.S.D.I., N.P.S. Final Wilderness Recommendation, Grand Canyon National Park. Arizona. February 1977

APPENDIX A

Policy Statements

NATIONAL PARK SERVICE - DEPARTMENT OF THE INTERIOR

The National Park Service is guided in its land management policies by the National Park Service Organic Act of 1916 (39 Stat. 535). The Act states that the National Park Service shall promote and regulate the use of parks to conform to the fundamental purpose of the parks, which is ". . . to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations."

The National Park Service manages the resources of the National Park System to maintain and perpetuate their inherent integrity. Management of park lands possessing significant natural features and values is concerned with ecological processes and the impact of people upon these processes and resources. The concept of perpetuation of a total, natural environment or ecosystem, as compared with the protection of individual features or species, is a distinguishing aspect of the Service's management of natural lands.

The National Park Service preserves and provides for the appropriate recreational use of natural and cultural resources of national importance within the National Park System and cooperates with others to protect and perpetuate similar resources of local, state, regional, national, and international importance for the benefit of humankind.

Criteria for Parklands

Areas considered for addition to the National Park System shall be subjected to criteria dealing, in turn, with (1) significance, (2) suitability/ feasibility, and (3) management alternatives.

Significance

An area proposed primarily for its natural and/or cultural resources must possess outstanding national significance as determined by a professional evalulation, the National Park System Advisory Board, and the Secretary of the Interior. Significance must relate to the themes contained in the National Park System Plan, or in the case of a historic property, to new themes that may be approved as history continued to unfold. To be suitable for inclusion in the System, an area should represent themes presently unrepresented or poorly represented in the System, or should transcend related units of the System in resource values or interpretive potential. An area proposed as a National Recreation Area must contain significant natural and/or cultural resources, and it must be capable of meeting regional recreation deficiencies on a scale which, because of jurisdictional, financial, and operational consideration, cannot reasonably be met by others.

Suitability/Feasibility

An area meeting the criterion of significance must be feasible for administration, protection, and preservation. It should be of an adequate size and configuration to preserve the significant resource values and contain such additional lands as may be necessary to accommodate essential public and administrative needs and the retained rights, if any, of private landowners. For historical areas, this means the inclusion of sufficient land to protect all significant historic features associated with the park theme and such additional lands as may be necessary to protect the historic scene.

Management Alternatives

The Service will consider (1) whether the area is or will be assured of being adequately protected through other alternatives for preservation outside the System and (2) whether, under such protection, it would be available for public appreciation and use. If these two criteria will be met by other means, the Service would not ordinarily recommend the addition of the areas to the System.

Criteria for Determining National Significance

Natural Resources

Nationally significant resources are those which have exceptional values or qualities illustrating or interpreting the geological/ecological themes of our nation.

These values are considered and weighed against stringent guidelines when gauging national significance. An integral part of national significance is a site's integrity. It should be a true, accurate, essentially unspoiled example of natural history.

The following guidelines are used:

-- An outstanding example of a geologic landform or biotic area that is still common or of broad distribution.

-- A rare extant remnant geologic landform or biotic area of a type that is now vanishing due to human desoilment, although once widespread.

-- An extant geologic landform or biotic area that was extremely unique in the region or nation during presettlement times.

-- A site possessing exceptionally high ecological or geological diversity, e.g., species, biotic communities, habitats, landforms, observable geological processes.

-- A site containing biotic species or communities whose natural distribution at that location makes them of unusual biogeographic significance, e.g., high numbers at range limits or of diverse geographic affinities, relics, endemics, extreme disjuncts.

-- A site harboring a concentrated population of rare plant or animal species, particularly those officially recognized as threatened or endangered.

-- A critical refuge necessary for the continued survival of either common or uncommon wildlife species.

-- An outstanding scenic area.

-- A site that can be described as an invaluable ecological or geological benchmark due to an extensive and long-term record of research and scientific discovery.

Cultural Resources

National significance is ascribed to structures, sites, objects, and districts that possess exceptional value or quality in illustrating or interpreting the cultural heritage of our nation, such as:

-- Properties at which events occurred that have significantly contributed to, are identified prominently with, or outstandingly represent the broad cultural, political, economic, military, or social history of the nation, and from which an understanding and appreciation of the larger patterns of our American heritage may be gained.

-- Properties associated importantly with the lives of persons nationally significant in the history of the United States.

-- Properties associated significantly with an important event that outstandingly represents some great idea or ideal of the American people.

-- Structures that embody the distinguishing characteristics of an architectural type specimen, exceptionally valuable for a study of a period, style, or method of construction; or a notable structure representing the work of a master builder, designer, architect, or engineer.

-- Objects that figured prominently in nationally significant events, or that were prominently associated with nationally significant persons, or that outstandingly represent some great idea or ideal of the American people, or that embody distinguishing characteristics of a type specimen, exceptionally valuable for a study of a period style or method of construction, or that are notable as representatives of the work of master workers or designers.

-- Archeological sites that produced information of major scientific importance by revealing new cultures, or by shedding light upon periods of occupation over large areas of the United States. Such sites are those which have produced, or which may reasonably be expected to produce, data affecting theories, concepts, and ideas to a major degree.

-- Historic districts composed of structures not sufficiently significant individually by reason of historical association or architectural merit to warrant recognition, that when preserved or restored as integral parts of their environment are of historical significance to the nation in commemorating or illustrating a way of life in its developing culture.

National Recreation Areas

The following criteria are established for the evaluation and selection of areas proposed for Congressional designation as National Recreation Areas in the National Park System and are to be applied to all proposals:

-- National recreation areas should be spacious areas containing outstanding natural and/or cultural features and providing significant recreational opportunities.

-- National recreation areas should be located and designed to achieve comparatively heavy recreational use and should usually be located where they can contribute significantly to the recreational needs of urban populations.

-- National recreation areas should provide recreational opportunities significant enough to assure national as well as regional visitation.

-- The scale of investment, development, and operational responsibility should be sufficiently high to require either direct Federal involvement or substantial Federal participation to assure optimum public benefit.

Within the national recreation area, outdoor recreation shall be recognized as a primary management purpose; however, such management shall be compatible with the protection of the natural and cultural resources.

BUREAU OF LAND MANAGEMENT - DEPARTMENT OF INTERIOR

The Bureau of Land Management's public land policy is based on the Federal Land Policy and Management Act of 1976 (P.L. 94-579, October 21, 1976), which established guidelines for its administration: to provide for the management, protection, development, and enhancement of the public lands.

The Bureau's policy is based on the premise that any particular land area and its resources offer the potential for a variety of uses, some of them mutually exclusive. It is the objective of the Bureau to provide maximum public benefits through the best combination of uses of which an area is capable.

Within the multiple-use objective, the following components have been established:

Domestic-Livestock Grazing: The protection, regulated use, and development of forage-producing public lands and the mangement of livestock use to obtain a sustained yield of forage.

Fish and Wildlife Development, Utilization and Protection of Endangered and Threatened Species: The protection, regulated use, and development of habitat on public lands and waters to obtain a sustained yield of fish and wildlife; provision and maintenance of public access to fish and wildlife resources; and conservation of endangered and threatened species and their habitats.

Industrial Development: The protection, regulated use, and development of public lands in a manner to facilitate the growth and stability of industry, whether off-site or on-site, long-term or short-term.

Mineral Production: The protection, regulated use, and development of public lands in a manner to facilitate the extraction and processing of minerals, whether off-site or on-site, long-term or short-term.

Occupancy: The protection, regulated use, and development of lands as sites for economically and socially useful structures, either publicly or privately owned.

Outdoor Recreation: The protection, regulated use, and development of public lands having open space values in a manner that will preserve those values and make them available for appropriate recreational enjoyment by the public.

Timber Protection: The protection, regulated use, and development of public forest and woodland areas to obtain a sustained yield of forest products.

Watershed Protection: The protection, regulated use, and development of any public lands in a manner to control runoff; to minimize solid erosion, siltation, and other destructive consequences of uncontrolled water flows; and to maintain and improve storage, yield, quality, and quantity of surface and subsurface waters.

Wilderness Preservation: The inventory of roadless areas, 5,000 acres or more, and the identification of study areas with wilderness character from these roadless areas, and the interim management of these study areas so as not to impair the suitability of such areas that might be designated by Congress as wilderness, and management of designated wilderness areas according to the Wilderness Act of 1964 and Federal Land Policy and Management Act of 1976.

Preservation of Public Values: The preservation of public values that would be lost if the land passed from Federal ownership--the protection, regulated use, and development of any public lands having unique or scarce characteristics or site values in a manner to insure their continued availability to the general public, either national or local, temporarily or permanently, and the prevention of avoidable losses and damage, including avoidance of use and development which may require future expenditures for flood protection and flood damage relief.

Cultural Resources: The management and protection of historical, archeological, and paleontological resources in a manner that will preserve these values and avoid inadvertent loss or destruction of these resources.

FOREST SERVICE - U.S. DEPARTMENT OF AGRICULTURE

The Forest Service is charged with administration of the National Forest System. The National Forest System's policy is to manage all resources of these lands under the principle of multiple use and sustained yield so that the products and benefits therefrom will best serve local and national needs of the people.

Administration of the National Forests, from the beginning, has dealt with the management and use of a variety of resources. The Act of June 4, 1897, that provided for the administration of the forest reserves, later National Forests, stated that the purposes of these reserves were to improve and protect the forests, secure favorable conditions of waterflows, and furnish a continuous supply of timber for the use and necessities of the citizens of the United States. A general management policy was laid down by the Secretary of Agriculture in his letter of February 1, 1905, to the Chief Forester, when he said, ". . . all the resources of the forest reserves are for use . . . under such restrictions only as will insure permanence of these resources."

The Multiple Use-Sustained Yield Act of June 12, 1960, supplemented the 1897 Act and gave legislative status to the Forest Service multiple-use policy. This Act expressed it to be "the policy of the Congress that the National Forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes;" and authorized and directed the Secretary of Agriculture "to develop and administer the renewable surface resources of the National Forests for multiple use and sustained yield of the several products and services obtained therefrom." The establishment and maintenance of areas of wilderness are consistent with the purposes and provisions of the Act.

Two recent pieces of legislation have provided the Forest Service with additional guidelines for the administration, management, protection, and development of public lands.

The Forest and Range Land Renewable Resources Planning Act of 1974 directs that long-range plans be developed to insure that the United States has an adequate future supply of renewable resources from the nation's 1.6 billion acres of public and private forests and rangelands, while maintaining the integrity and the quality of the environment. It requires that the Secretary of Agriculture prepare a renewable resource assessment for the nation every ten years and a long-range renewable resource program for the Forest Service every five years. The most recent resource planning update shows a needed increase in wilderness acres in the Southwestern Region to meet the future anticipated demand. Kanab Creek is considered to be one of the potential wilderness areas which could be added to meet long-term wilderness needs.

The second piece of legislation having a direct effect on the management of National Forest lands is the Federal Land Management Policy Act of October 21, 1976. This law, among other things, states (Sec. 102-A):

> "The Congress declares that it is the policy of the United States that . . .

"(7.) Goals and objectives be established by law as guidelines for public land use planning, and that management be on the basis of multiple use and sustained yield unless otherwise specified by law.

"(8.) The public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource and archeological values; that where appropriate will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use."

Current management of the Kanab Creek area is designed to meet these objectives.

Lands of the Kaibab National Forest within the Kanab Creek portion of the proposed study area are managed by the Forest Service in accordance with these polices and the specific management direction of the Ranger District Multiple Use Plan. The area is within the Grand Canyon Game Preserve and the Kanab Creek New Wilderness Study Area multiple-use management units delineated by the Plan.

Within the preceding legislative framework, management direction for the Kanab Creek area is as follows:

Wildlife habitat is managed to provide suitable habitat for game and nongame species. A primary objective is to provide opportunities for sportsmen, bird and animal watchers, photographers, and others to enjoy the wildlife resource. The Kanab Creek area is á part of the Grand Canyon National Game Preserve, established by Presidential Proclamation in 1906. Section 1 of the Proclamation provides that "these lands are designated and set aside for the protection of game animals and to be recognized as a breeding place therefore." The land is presently open to hunting; and under Title 36, CFR 241.2, the Forest Service has entered into an agreement with the Arizona Game and Fish Department whereby the Department provides the needed hunting regulations for these game preserve lands.

Wilderness is managed to maintain the natural character of the land while providing opportunities for its use and enjoyment. Much of the nation's designated wilderness areas are within national forests. This gives the Forest Service a major responsibility for preserving a delicate but increasingly important resource and for making it available to the growing numbers of wilderness enthusiasts while protecting it from encroachment and abuse. Most of the Kanab Creek area is within a roadless area selected by the Chief of the Forest Service for study for potential inclusion in the wilderness system. Kanab Creek is a candidate for wilderness status in seven of the eight management alternatives being considered in the current Roadless Area Review and Evaluation (RARE II) now being conducted by the Forest Service.

Forest Service policy is to manage new wilderness study areas to preserve their wilderness values pending final studies and Congressional determination of their inclusion in the wilderness system. Wildlife management and grazing domestic livestock are permitted uses as long as wilderness values are not compromised.

Range is managed to provide forage for domestic livestock, which are permitted to graze on the National Forest System land in a manner consistent with the needs of other resources and uses.

Recreation opportunities on National Forest land are managed to best serve the steadily increasing number of Americans seeking relaxation in the outdoors. Attractions range from family picnic areas to vast wilderness tracts. The Forest Service, in its Recommended Renewable Resource Program, developed as required by the Resources Planning Act of 1974, chose a recreation goal that will increase the supply of outdoor recreation opportunities and services through the supply of outdoor recreation opportunities and services through programs that emphasize dispersed recreation. The Kanab Creek portion of the study area is managed consistently with its new wilderness study area status and is receiving increased use by hikers and horseback riders. Trailheads which serve Kanab Creek and sections of the Grand Canyon National Park are located above the rim within the study area.

Timber is managed to produce a continuous flow of wood products to serve America's many demands; however, there are no commercial timber stands within the Kanab Creek portion of the study area.

Watersheds are managed to regulate streamflow, to control floods and erosion, and to store waters. There are no perennial streams within the Kanab Canyon area. Kanab Creek is an intermittent stream with some year-round pot holes. There are some springs in the area.

Fire Management and Insect and Disease Management is provided for the protection, maintenance, and enhancement of the ecosystem through prevention, detection, and control.

Cultural Resources in the Kaibab Forest are presently being inventoried, and sites found during the inventory will be managed for their value as National Register Properties and/or their importance as a data resource for archeologists. Until inventories are sufficiently complete to allow development of an informed management strategy, it is Forest Service policy to preserve and protect all sites consistent with utilization of other resources. At present, very little formal inventory work has been done along Kanab Creek, but reports by Forest Service personnel indicate the presence of a significant number of sites. Controlled sampling inventories, in and around the areas, are planned for the near future.

93D CONGRESS } HOUSE OF REPRESENTATIVES { REPORT
2d Session } { No. 93-1611

ENLARGING THE GRAND CANYON NATIONAL PARK

DECEMBER 17, 1974.—Ordered to be printed

Mr. TAYLOR of North Carolina, from the committee of conference, submitted the following

CONFERENCE REPORT

[To accompany S. 1296]

The committee of conference on the disagreeing votes of the two Houses on the amendments of the House to the bill (S. 1296) to further protect the outstanding scenic, natural, and scientific values of the Grand Canyon by enlarging the Grand Canyon National Park in the State of Arizona, and for other purposes, having met, after full and free conference, have agreed to recommend and do recommend to their respective Houses as follows:

That the Senate recedes from its disagreement to the amendments of the House numbered 1, 6, 7, and 9 and agreed to the same.

That the House recedes from its amendments numbered 4 and 5.

That the Senate recedes from its disagreement to amendment No. 2 and agree to the same with an amendment as follows:

In lieu of the matter proposed to be inserted by the House amendment insert the following: *one million two hundred thousand acres*,

That the Senate recedes from its disagreement to amendment No. 3 and agree to the same with an amendment as follows:

In lieu of the matter proposed to be inserted by the House amendment insert the following: *113-20, 021 B and dated December 1974*,

The Senate recedes from its disagreement to the amendment of the House No. 8 and agrees to the same with an amendment as follows:

In lieu of the matter proposed to be inserted by the House amendment insert the following:

SEC. 10. (a) For the purpose of enabling the tribe of Indians known as the Havasupai Indians of Arizona (hereinafter referred to as the "tribe") to improve the social, cultural, and economic life of its members, the lands generally depicted as the "Havasupai Reservation Addition" on the map described in section 3 of this Act, and consisting of approximately one hundred and eighty-five thousand acres of land

38-006

and any improvements thereon, are hereby declared to be held by the United States in trust for the Havasupai Tribe. Such map, which shall delineate a boundary line generally one-fourth of a mile from the rim of the outer gorge of the Grand Canyon of the Colorado River and shall traverse Havasu Creek from a point on the rim at Yumtheska Point to Beaver Falls to a point on the rim at Ukwalla Point, shall be on file and available for public inspection in the Offices of the Secretary, Department of the Interior, Washington, District of Columbia.

(b) The lands held in trust pursuant to this section shall be included in the Havasupai Reservation, and shall be administered under the laws and regulations applicable to other trust Indian lands: Provided, That—

(1) the lands may be used for traditional purposes, including religious purposes and the gathering of, or hunting for, wild or native foods, materials for paints and medicines:

(2) the lands shall be available for use by the Havasupai Tribe for agricultural and grazing purposes, subject to the ability of such lands to sustain such use as determined by the Secretary;

(3) any areas historically used as burial grounds may continue to be so used;

(4) a study shall be made by the Secretary, in consultation with the Havasupai Tribal Council, to develop a plan for the use of this land by the tribe which shall include the selection of areas which may be used for residential, educational, and other community purposes for members of the tribe and which shall not be inconsistent with, or detract from, park uses and values; Provided futher, That before being implemented by the Secretary, such plan shall be made available through his offices for public review and comment, shall be subject to public hearings, and shall be transmitted, together with a complete transcript of the hearings, at least 90 days prior to implementation, to the Committees on Interior and Insular Affairs of the United States Congress; and Provided further, That any subsequent revisions of this plan shall be subject to the same procedures as set forth in this paragraph;

(5) no commercial timber production, no commercial mining or mineral production, and no commercial or industrial development shall be permitted on such lands: Provided further, That the Secretary may authorize the establishment of such tribal small business enterprises as he deems advisable to meet the needs of the tribe which are in accordance with the plan provided in paragraph (4) of this section;

(6) nonmembers of the tribe shall be permitted to have access across such lands at locations established by the Secretary in consultation with the Tribal Council in order to visit adjacent parklands, and with the consent of the tribe may be permitted (i) to enter and temporarily utilize lands within the reservation in ac-

cordance with the approved land use plan described in paragraph (4) of this section for recreation purposes or (ii) to purchase licenses from the tribe to hunt on reservation lands subject to limitations and regulations imposed by the Secretary of the Interior; and

(7) except for the uses permitted in paragraphs 1 through 6 of this section, the lands hereby transferred to the tribe shall remain forever wild and no uses shall be permitted under the plan which detract from the existing scenic and natural values of such lands.

(c) The Secretary shall be responsible for the establishment and maintenance of conservation measures for these lands, including, without limitation, protection from fire, disease, insects, or trespass and reasonable prevention or elimination of erosion, damaging land use, overgrazing, or pollution. The Secretary of the Interior is authorized to contract with the Secretary of Agriculture for any services or materials deemed necessary to institute or carry out any such measures. Any authorized Federal programs available to any other Indian tribes to enhance their social, cultural, and economic well-being shall be deemed available to the tribe on these lands so long as such programs or projects are consistent with the purposes of this Act. For these purposes, and for the purpose of managing and preserving the resources of the Grand Canyon National Park, the Secretary shall have the right of access to any lands hereby included in the Havasupai Reservation. Nothing in this Act shall be construed to prohibit access by any members of the tribe to any sacred or religious places or burial grounds, native foods, paints, materials, and medicines located on public lands not otherwise covered in this Act.

(d) The Secretary shall permit any person presently exercising grazing privileges pursuant to Federal permit or lease in that part of the Kaibab National Forest designated as the "Raintank Allotment", and which is included in the Havasupai Reservation by this section, to continue in the exercise thereof, but no permit or renewal shall be extended beyond the period ending ten years from the date of enactment of this Act, at which time all rights of use and occupancy of the lands will be transferred to the tribe subject to the same terms and conditions as the other lands included in the reservation in paragraph (b) of this section.

(e) The Secretary, subject to such reasonable regulations as he may prescribe to protect the scenic, natural, and wildlife values thereof, shall permit the tribe to use lands within the Grand Canyon National Park which are designated as "Havasupai Use Lands" on the Grand Canyon National Park boundary map described in section 3 of this Act, and consisting of approximately ninety-five thousand three hundred acres of land, for grazing and other traditional purposes.

(f) By the enactment of this Act, the Congress recognizes and declares that all right, title, and interest in any lands not otherwise declared to be held in trust for the Havasupai Tribe or otherwise covered

by this Act is extinguished. Section 3 of the Act of February 26, 1919 (40 Stat. 1177; 16 U.S.C. 223), is hereby repealed.

And the House agree to the same.

JAMES A. HALEY,
ROY A. TAYLOR,
MORRIS K. UDALL,
THOMAS S. FOLEY,
LLOYD MEEDS,
JOE SKUBITZ,
SAM STEIGER,
KEITH G. SEBELIUS,
RALPH S. REGULA,
Managers on the Part of the House.

HENRY M. JACKSON,
ALAN BIBLE,
FRANK CHURCH,
PAUL J. FANNIN,
CLIFFORD P. HANSEN,
Managers on the Part of the Senate.

JOINT STATEMENT OF THE COMMITTEE OF CONFERENCE

The managers on the part of the House and Senate at the Conference on the disagreeing votes of the two Houses on the amendments of the House to the bill (S. 1296), to further protect the outstanding scenic, natural, and scientific values of the Grand Canyon by enlarging the Grand Canyon National Park in the State of Arizona and for other purposes, submit this joint statement in explanation of the effect of the language agreed upon by the managers and recommended in the accompanying Conference Report.

There were four principal differences between S. 1296 as it passed the Senate and the amendments to the bill adopted by the House. These differences, and the disposition of them, which the Conference Committee recommends are as follows:

(1) Area To Be Included

Both the House and Senate versions of S. 1296 were designed to consolidate into one Grand Canyon National Park the geographic area known as "The Grand Canyon". While the Senate version included much of the same area as the House version, the House amendments would have included some significant side canyon systems and encompassed the entire Grand Canyon and the entire Colorado River from the Paria River to the Grand Wash Cliffs near the headwaters of Lake Mead. In resolving these differences, the members of the Conference Committee recommend the boundaries approved by the House with the following exceptions:

(1) Parashannt, Andrus and Whitmore Canyons;
(2) Kanab Canyon; and
(3) Shirwitz Plateau.

While the managers did *not* include in their recommendation these areas, their potential park value was recognized and it was agreed that they should be studied by the Secretary of the Interior for possible future consideration for addition to the park by the Congress. To this end, the Committee of Conference *directs* the Secretary of the Interior to study these areas to determine if they, or any part of them, qualify for national park designation. Once this study is completed, it is to be transmitted, together with his recommendations to the Congress, for its consideration.

(2) Areas for Study

The House and Senate both included provisions for the study of certain areas to determine if they should be retained as a part of the park. Under that study language, these areas would be tentatively included in the park, but, after review, they might be eliminated from the park

boundaries by Congressional action. The areas known as the Parashannt Allotmet and Kanab Canyon which were added by the House were to be subject to this review procedure, but since they were deleted from the boundaries, they are to be studied separately and possibly recommended for inclusion in the park by some future Congress.

(3) Havasupai Reservation Enlargement

One of the major differences between the House and Senate versions of S. 1296 involved the provision concerning the Havasupai Indian Reservation. The Senate approved version provided that the Secretaries of Interior and Agriculture study the needs of the Havasupai Tribe and make detailed recommendations to the Congress and the President concerning proposals for the expansion of the reservation. The House amendment included a provision for an immediate enlargement of the reservation and specified that the boundaries would be located on the plateau one-quarter of a mile from the rim of the canyon except where it crosses Havasu Creek from Yumatheska Point to the top of Beaver Falls to Ukwalla Point; thus granting trust title to approximately 185,000 acres of national park, monument and forest land to the Havasupai Tribe.

Under the terms of the House amendment, the lands are to be used by the tribe subject to the limitations enumerated in the legislation and in accordance with a plan to be developed by the Secretary of the Interior in consultation with the tribal council. As recommended, the plan is not to allow any uses which would "be inconsistent with or detract from, park uses and values." It is the intention of the conferees, by this language, to assure the protection of the scenic, natural, and scientific values from any degradation which would result if adverse uses were permitted. As agreed by the Committee, once this plan is developed, it—along with any revisions to it—must be made available to the public for review and comment, must be the subject of public hearings, and must be presented to the Congress at least 90 days before being implemented.

The House amendment was also modified to specifically prohibit commercial enterprises and activities on the lands transferred, but it does permit small tribal business enterprises which are under the control, operation, and administration of the tribe; which are approved by the Secretary; and which are in accordance with the land use plan required by the Act. In considering this language, the conferees recognized that a need might be shown for such small businesses as gasoline stations, trading posts and customary businesses (grocery stores, drugstores, and the like) which are needed to serve any Indian residential communities which might result from the enlargement of the reservation.

As approved by the House, this amendment makes it clear that nonmembers of the tribe are to have established reasonable access routes across the reservation to visit the adjacent parklands. In addition to this provision, the Committee recommends that the tribe be authorized to issue licenses to hunt on reservation lands to nonmembers of the tribe. Such licenses are to be subject to such limitations and regula-

tions as the Secretary shall prescribe, but such licenses shall not extend to nor permit any hunting privileges on any lands within the Grand Canyon National Park. Since game animals—particularly bighorn sheep—move across park boundaries intermittently, it is essential that the Secretary develop stringent regulations to assure the preservation of the wildlife of this region and to assure the integrity of the park as a wildlife sanctuary.

(4) Wilderness Areas

The Senate version of the bill contained no specific wilderness study provision. The House amendment provides for a study of all lands—including the entire river from the mouth of the Paria to the headwaters of Lake Mead—within the revised park boundaries to be studied for possible designation as wilderness under the terms of the Wilderness Act. In this connection, the conferees specifically noted that the lands designated by the Act as "Havasupai Use Lands"—which are entirely within the park boundaries—should be considered by the Secretary in making any recommendations for a wilderness area within the Grand Canyon National Park notwithstanding allowed tribal uses.

The managers on the part of the House and Senate recommend the approval of S. 1296 with the amendments and modifications explained above.

James A. Haley,
Roy A. Taylor,
Morris K. Udall,
Thomas S. Foley,
Lloyd Meeds,
Joe Skubitz,
Sam Steiger,
Keith G. Sebelius,
Ralph S. Regula,
Managers on the Part of the House.

Henry M. Jackson,
Alan Bible,
Frank Church,
Paul J. Fannin,
Clifford P. Hansen,
Managers on the Part of the Senate.

O

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
WESTERN REGIONAL OFFICE
450 GOLDEN GATE AVENUE, BOX 36063
SAN FRANCISCO, CALIFORNIA 94102

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

POSTAGE AND FEES PAID
U. S. DEPARTMENT OF INTERIOR
INT-417

